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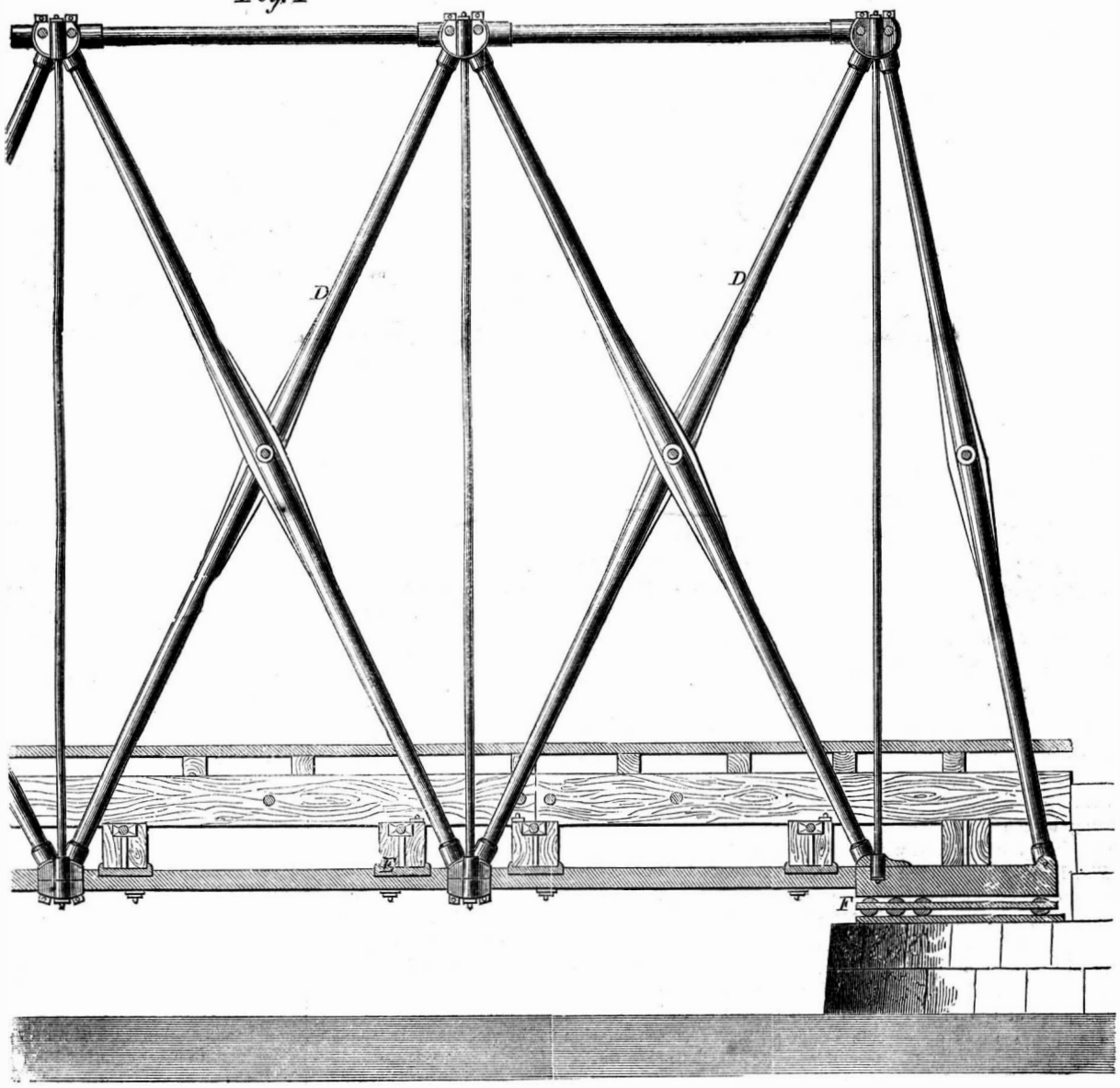
Improved Patent Truss Bridge.

The rapid increase of our inland transportation, as well as the necessity of guarding against accidents which result in the loss of life and property, has clearly demonstrated the importance of employing materials of the most tenacious and durable character in the construction of bridges on railroads and over other places. It can no longer be considerations of economy that will induce practical railroad

Fig. 1



JONES'S PATENT TRUSS BRIDGE.

men to adopt wood instead of iron for structures of the kind under discussion, when it is known that the average durability of uncovered wooden bridges in this country has been from about five to seven years; and their first cost from one-third to four-fifths of that of iron bridges. It is true that if wooden bridges are sided, covered in, and kept thoroughly painted, their durability will be greatly increased, but even with these additions they are still more liable to sudden destruction from fires, accidental or designed, and are also exposed to danger from high winds, or other elemental disturbances; to prevent such disasters, a close watch must be kept over the bridge, all of which must be added to the annual cost of maintaining the structure. It is often the case, when a bridge is thus destroyed, that the cost of removal is greatly increased, and in many instances exceeds the cost of an iron bridge, entailing also a heavy loss to the railroad company for extra transportation of freight and passengers, and loss of business while renewing the bridge. Such accidents have a tendency to drive business to other roads in the immediate neighborhood. For a practical demonstration of the above facts, we have only to refer to the books and bridge accounts of roads running at the West. Data based upon experience shows that there is a saving of iron over wood of from six to seven hundred per cent, at the end of fifty years, on the cost of the bridges alone.

With regard to the durability of iron bridges, fifty years is a comparatively short life, when we take into consideration that we have accounts of bridges that have stood for hundreds of years.

The success of all iron bridges must necessarily depend upon the form of construction, as well as a proper distribution of materials; consequently the injurious effects of sudden jars and concussions must be provided for. Experience has taught mechanics that the most economical mode of applying material in all iron structures, is to employ wrought-iron to resist tension, torsion, or transverse strain; and cast-iron to oppose compression. These principles have been strictly adhered to in J. L. Jones's Iron Truss Bridge, herewith illustrated. This bridge has a truss frame, similar to the "Howe Truss" in its principles and mode of construction; but it has many original and valuable mechanical arrangements in its details, which render it peculiarly applicable to the service required of it, avoiding the injurious effects of jar and concussion. The bridge can be erected on any masonry where ordinary wooden bridges have been in use, without incurring the expense of altering the bridge seat. A bridge on this plan was erected on the St. Louis and Iron Mountain Railroad, 30 miles

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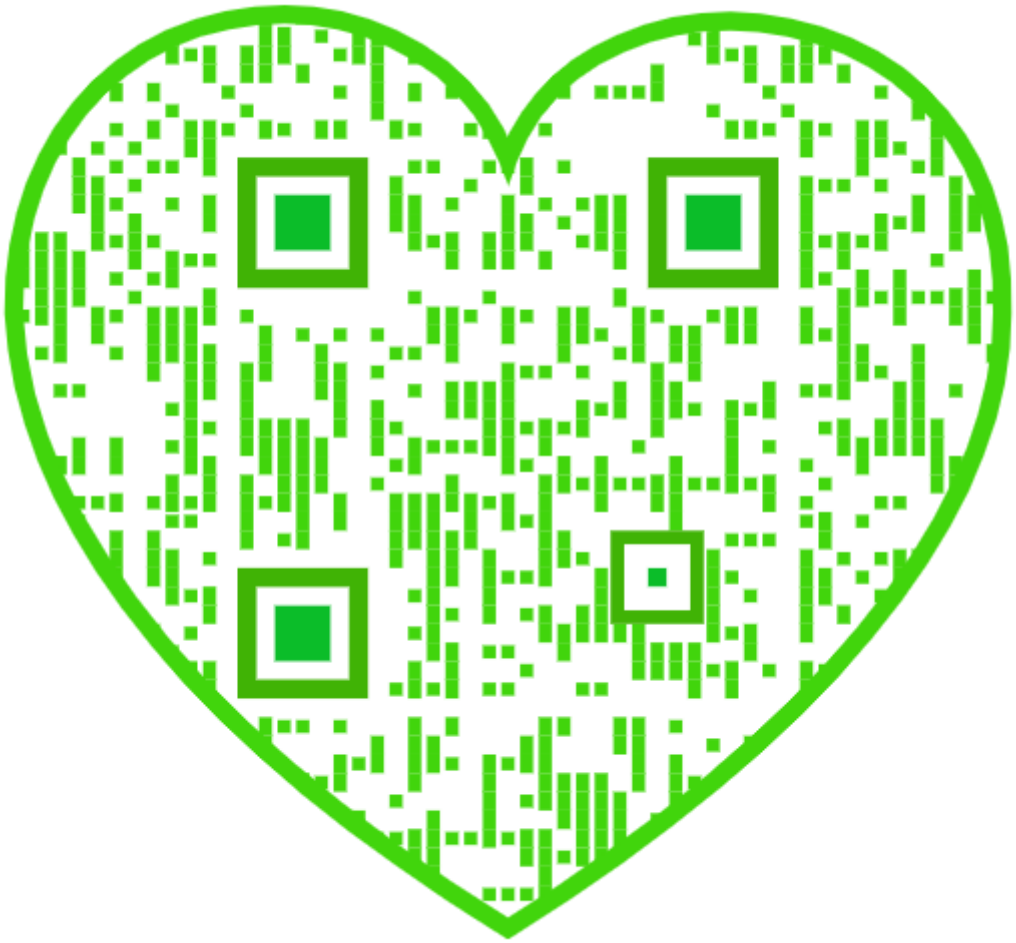
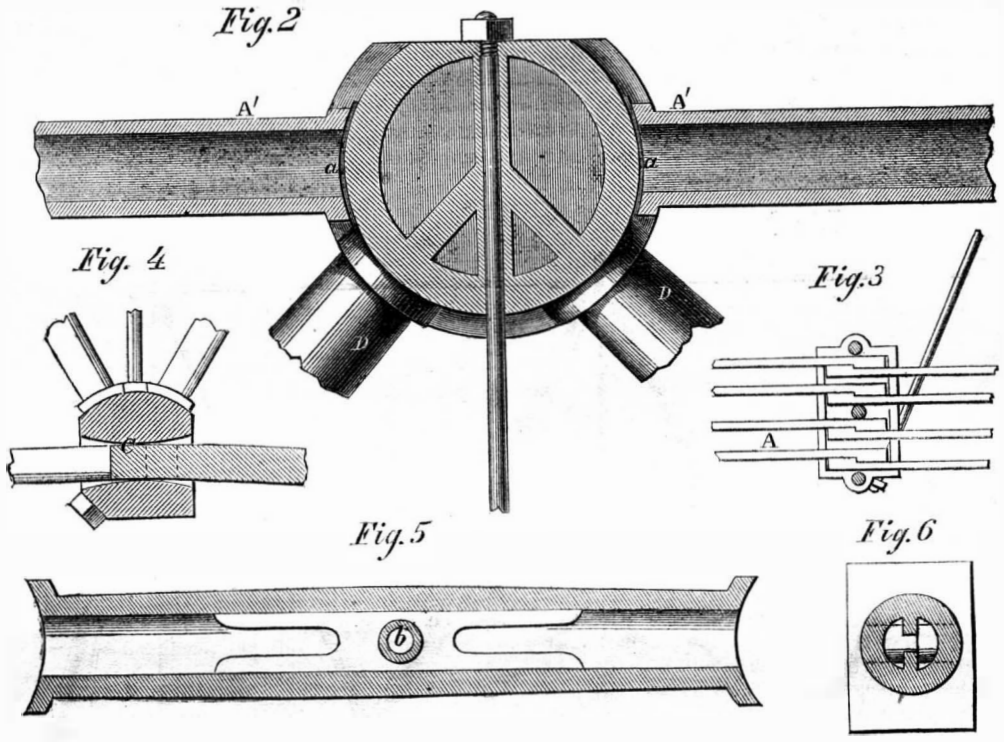


south of St. Louis, Mo., in July, 1861. This structure is 140 feet in the span, and has withstood a test pressure of 140 tuns, deflecting but 1⅛ inches under this weight; the iron being removed, the bridge assumed its proper shape. After having been in use two years without costing one dollar for repairs or adjustment of any kind, the Board of Directors, in their annual report, made favorable mention of its good qualities, and conclude their report by recommending the bridge to all railroad corporations using such structures.

The mechanical arrangement of the details of this bridge are excellent, and provide against all possible derangements; those which arise from the natural variations of temperature in winter and summer, and from the wear and tear of passing travel. The roadway or track is laid upon a series of wrought-iron stringers; these stringers are of peculiar shape at each end, and may be seen by referring to the cut, Fig. 3. The bridge is built in several sections, each one of which can be transported separately to the point of erection; and the vertical disturbance caused by the deflection of the roadway is provided for in the following manner: The stringers, previously mentioned, are off-set at their ends, and have square shoulders, which interlock and maintain a connection throughout the whole span, at the same time admitting of vertical motion to provide for this, the cap (Fig. 3) is rounded away, as shown at C, in Fig. 4, so that while the main point—the strength of the stringer—is preserved, their free movement is unimpaired. At the top the ends of the braces, A', abut against the cylindrical block, shown in an enlarged form at Fig. 2; this constitutes a ball-joint, as it were, on which all the braces work freely without binding. When it is necessary, from any cause, to take up lost motion, or to alter the spring of the arch, plates can be inserted, as at *a*, in Fig. 2. Figs. 5 and 6 are illustrations of the braces which connect the diagonal braces, D, in Fig. 1; the diagram explains itself; strong bolts, *b*, pass through these tubes, and add materially to the efficiency and strength of the bridge; constituting, as they do, a series of transverse ties of great rigidity. The casting is rendered light and yet strong by the rib inside. The bottom stringers of the roadway are provided with struts or saddles, E (see Fig. 1), which span each one at regular distances, so that they cannot buckle under pressure; the floor beams are bolted to these saddles by the usual methods. The main diagonal braces, D, are of cast-iron, and the form of them clearly shown in Fig. 1; where the manner of connecting them to the other separate parts of the bridge is also illustrated. All the cast-iron tubes about this bridge have been subjected to a pressure of 50 tuns. None of the pieces in the bridge exceed 21 feet in length, or weigh over 1,000 pounds. In Fig. 1, the means of providing against longitudinal expansion and contraction are clearly shown at F. The spring in the arch of the bridge, technically known as "camber," can be altered at will, and the whole structure is represented by the inventor as having given great satisfaction wherever introduced. A number of testimonials have been shown respecting the estimation it is held in by those competent to criticise its merits.

Two patents have been issued to Jonathan L. Jones, of St. Louis, Mo., for this invention; they bear date Nov. 6, 1860, and August 4, 1863. Further information can be had by addressing Jones & Westlake, St. Louis, Mo.



IMPROVED TRUSS BRIDGE.

A Congress of German Workingmen.

A congress of the working men of Germany was recently assembled at Frankfort, to take into consideration their duties to themselves and to the state. It consisted of one hundred and twenty delegates, from eighty-four associations, comprising thirty-six thousand workmen, whose number is constantly increasing. Their proceedings were marked by great dignity of demeanor, and a thorough conviction of the necessity and importance of progress. They have been divided for some time past—indeed, ever since the termination of the revolution—into two sections; the one known as the moderates, the other as the radicals; and as these refused all compromises with each other, they have greatly weakened their power, and enabled their mutual enemies to profit by their differences. After the political catastrophes of 1849, when the progressives took the lead, two causes retarded the rapidity of the movement, one of which was an apparent incapacity on the part of the masses to choose proper representatives in their assemblies; and the other, the want of agreement among the leaders as to the principles which were to govern in the domain of pure politics and political economy.

At Frankfort, the first act of the assembly was to declare its objects to be to further the moral, social, and political improvement of the working classes; to express a warm approbation of the party of progress, and all others who aimed at the advancement of humanity.

1. The necessity of perfecting their knowledge in all directions, but especially of political economy, morals, history and technology, so as to improve and ennoble their characters by developing their minds and talents.

2. A recommendation to the various societies composing their organization, to cultivate "those higher amusements and tastes which would repress all habits of debauchery."

3. Absolute freedom of trade and profession, and a modification of the laws of domicile and marriage, which are now felt to be a grievous burden.

4. The determination to establish savings banks; mutual societies to aid the sick, the unemployed and the old; and also institutions having for their object the extension and use of credit and the purchase of materials.

These resolutions are highly approved by the German liberal press; and a leading Belgian journal, in commenting upon them, says that men who think in so noble a manner are worthy of enjoying the liberty they seek. But the passage of the resolutions shows to what an extent the laboring classes of the Continent suffer under disabilities. They seem to be bound hand and foot in the relations of life, by the institutions, the customs and the laws which have grown up, without amendment, during centuries. In their houses, in their trades, in their traffic with each other, in the simple rights of locomotion, they are not free; but meet everywhere with obstacles which embarrass their movements, restrain their industry, lessen its rewards and diminish their enjoyments.

The workingmen of the United States scarcely know or appreciate the blessings which they owe to our free institutions. Compared with the same class in the Old World their condition is indescribably superior. The simple fact that the government, and all the proceedings of the government, and of the institutions dependent upon the government, no less than its spirit, are controlled by the great principle of the essential equality of man, gives them an advantage which it is impossible to over-estimate. It opens all avenues of life to them, enables them to make the best of their capacities, to prosecute whatever ends they please, and to participate in every result of civilized existence. Whatever of usefulness, whatever of dignity, whatever of enjoyment belongs to the socialstate, it is within the power of every man among us, be his origin or lot ever so humble, to secure by honest exertion.

No class is, then, more deeply interested in sustaining thatUnion which is the source of our free institutions, than the mechanics and workingmen who here enjoy the privileges they guarantee. Those who, under false political leaders, are led at any time to disloyalty and disorder, are not only criminally unjust to their fellow-men, but are their own worst enemies. If the doctrines of the rebellion could prevail on this continent labor would sink to the lowest value, and the workingmen would be reduced to the character of slaves, to a proud, selfish and inhuman aristocracy, such as have held four millions of human beings in the most miserable servitude. This war of ours, brought on by this cruel class of men, is not a contest for nationality merely, but for the preservation of liberal government and the security of a society in which all are equal, exempt from bondage, and rendered capable of an indefinite progress.—*Evening Post.*

New Balloon Experiment.

A meeting composed of members of the French National Institute, of various scientific societies, of railway directors, bankers and directors of the press, was held recently at the manufactory of M. Nadar, to hear his explanation of a new balloon. M. Nadar explained to the assembly his theory of aerial locomotion by the substitution of a screw and of inclined planes for the present system of air balloons. M. Nadar concluded by appealing to the company to assist him in making his system known, and in reducing it to practice. M. de la Landelle, who is connected with Nadar in the construction of the balloon, confirmed his colleague's statement, and set in motion several models of machines constructed by M. de Ponton d'Annecouri, who is likewise a partner in the affair. These balloons were raised automatically, lifting graduated weights so perfectly as in all appearance to demonstrate the accuracy of the theory.

It is announced that an Anglo-French company is formed to provide the amount necessary for the con

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struction of a gigantic balloon, capable of containing eighty persons in a car two stories high, which will contain provisions and other necessaries, including, it is said, a printing press. The diameter of the balloon is to be equal to three-fourths the hight of the towers of Notre Dame. Twelve thousand yards of white silk have been supplied by a Lyons manufacturer, at 7f. the yard. This monster balloon is to be inaugurated next month at the races of Baden Baden. Subscribers for the trip have already set down their names. It is to last eight days and eight nights. After having made a trip across the channel and another to the Mediterranean, the company at whose expense the balloon is to be constructed, will exhibit it in London, Paris and New York. The produce of the exhibition is to be employed in the construction of a definite aerial locomotive. M. J. Godard, the celebrated aeronaut, has suggested an improvement to M. Nadar in the addition of a second balloon under the large one, which may serve as a reservoir for the preservation of a supply of gas, by which means the journey through the air may be prolonged.

THE FAIR OF THE AMERICAN INSTITUTE.

The Academy continues to present attractions to sight-seers, and crowds of persons visit the hall, day and evening, to witness the ingenuity and enterprise of our manufacturers and inventors. Since our last article the appearance of the Exhibition has not been materially changed, but a little more order and regularity is visible in the disposition of the different articles. The ladies continue to gather in crowds around the washing and sewing machines, deeply interested in the efforts of ingenious men to lighten the labors of housekeeping. The superb braiding, or embroidery, now so fashionable, which is done by the sewing machines, appears to great advantage; and is another evidence of the versatility and wide range of usefulness which these indispensable machines possess. Another novel feature in sewing machines has lately been introduced by Messrs. Wheeler & Wilson, it is

A BUTTON-HOLE MACHINE.

After much time, and at a great expense, a machine for sewing button-holes has at length been produced. The work done by it is remarkably beautiful in appearance, and much stronger and more durable than hand-made button-holes.

We are not sufficiently versed in the art and mystery of needlework to describe the sort of stitch taken by the machine; but externally the character of it seems to be much the same as that on all button-holes, while for elegance and strength it far exceeds the old method of doing such work. One thousand button-holes can be made per day on this machine—a sufficient attestation of its value to manufacturers and others. We did not learn that it was the intention to furnish such machines for family use; but gathered from the attendant that they are intended for tailors and those who have sufficient work of the kind to keep the machine going. A short distance off from this useful instrument stood another, in a dark corner, and altogether, considering its character, strangely neglected; this was

A PATENT TREADLE-MOTION.

This is a set of rods connected by short arms to a pair of cams (such we took them to be) working on a coupling. It is impossible to give an intelligible description of this motion without drawings; but it worked admirably and is a most excellent invention for sewing machines, foot-lathes, and all purposes where a treadle is used. The machine can only run one way, and *has no dead center;* in this respect it would be desirable for steam pumps, &c. Charles Spencer is the patentee.

WASHING MACHINES.

Of these machines Johnson's was pointed out to us as having taken the first prize at the Hamburgh Fair in Germany. Avery's pendulum machine—consisting of a series of small rollers arranged around a drum, the whole operated by a lever like a pump-handle—was novel to us, and seemed to do good work, as also did many others. The labor of washing by hand is very great, and the most fastidious housewife can find, in the great variety here, something to please her. Inventors have now only to make an ironing-machine, to render the laundry department complete. The wringers, or clothes-squeezers, need no comment; every woman is loud in their praise, and we have yet to hear of one who, knowing their virtues, does not use them or importune her husband for one.

A MITERING MACHINE.

Near the stage we noticed a compact little machine at work in mitering and dovetailing the edges of planks. A short length is placed on a bed, and, by a simple movement, the board is cut across, mitered, and dovetailed, at one operation; the dovetail is across, or at right angles with the grain, and is continuous throughout. When the pieces are fitted together they make a perfect water-tight joint. F. A. Gleason is the patentee.

PATENT WINDLASS.

E. Requa exhibits a patent windlass (illustrated on page 97, current volume of SCIENTIFIC AMERICAN), which is extremely convenient and well adapted to the work done by this class of machine. By a series of friction grooves and a quick pitch-screw, the work can be thrown in or out of gear instantly.

APPARATUS FOR STARTING CITY CARS.

When the cars on city roads stop for a passenger, the horses have great difficulty in overcoming the inertia of the load, and frequently strain themselves severely in trying to move the car. It is desirable to obviate this evil, and Mr. Bernard Morehan, has invented a motion which worked well in the small model at the Fair. It consists of a series of elliptic springs compressed together by the momentum of the car; when about to stop, these springs are thrown into gear with the axle, and the force of the momentum is stored up in them. When the car is to be started, the force of the springs is communicated to it by a simple method, and the horses are assisted according to the extent to which the springs are compressed. This is a very useful and much-needed machine, and if it works as well on a car as in the model, will be a manifest advantage.

IRON-CLAD BATTERY.

Captain Augustus Walker, of Buffalo, N. Y., exhibits a model of an iron-clad battery, which at once attracts the eye of the nautical man for its fine lines and the peculiar construction of its frame and hull. The hull is supported fore and aft by two arches, one inverted and interlocking with the other, through stanchions and bulkheads running athwart-ships; the whole forming a series of trusses or girders, as applied in the best bridges. The turret is semi-globular in appearance, externally, and the pilot-houses rise and fall through the deck so that they can be completely out of sight and danger from the enemy; the perfect control of the ship is not affected by this feature. No entrance can be effected to the vessel except through the pilot-houses. Thorough ventilation is obtained through a series of narrow slits or openings in the side. The design and conception of this ship as a light draft vessel—she being only 16 feet draft from keel to load-line—is very good, and we may have occasion to report on her hereafter at greater length. Other novelties were examined by us, but space will not permit further discussion of their merits at this time.

EXPORTS OF PETROLEUM.—The following table shows the immense proportions to which our trade in petroleum has attained:—Since Jan. 1, 1863, to Aug. 27, from New York, 13,579,677 gallons; from Boston, 1,322,779 gallons; from Philadelphia, 4,282,646 gallons; from Baltimore, 726,571 gallons; from Portland, 268,443 gallons; making a total of 20,080,116 gallons. It is exported to all parts of the civilized world. The Liverpool market is said to be overstocked at present, and prices for refined rule at from 2 shillings to two shillings and two pence sterling—a little over 50 cents per gallon wholesale.

A STEAM thrasher has been at work during part of the week, in thrashing grain for Mr. Mallory, of this town. The power consists of a 10-horse, portable, wood-burning engine, and it is claimed that considerable more grain can be thrashed in a day by this power than by horses. It is a humane improvement, at least; for thrashing, we believe, is pretty hard on the horses. We are informed the proprietor, Mr. McLeon, intends to stay in this vicinity during the season, and attend, as far as practicable, to all orders he may receive for thrashing.—*Lane Register.*

Mechanical and other Items of the War.

SHARP SHOOTING.—Our parallels, it is well known, had been carried close up to Fort Wagner, and it is necessary for the men, on both sides, to keep their bodies well covered, behind the intrenchments. The moment that a moving thing became visible, pop went a sharp-shooter, with unerring precision. The other day Capt. Luiss had occasion to adjust one of the sand baskets or "gabions," near the front, and in doing so his hands were exposed to the enemy for a few minutes, when he was struck by a sharp-shooter's ball. All the fingers [of his] right hand were taken off.

DURING the recent bombardment of Fort Wagner from the *New Ironsides*, it was found impossible to drive the balls through the sand and cotton of which the works are made, or to elevate the guns so as to throw the shot in as from a mortar. The gunners resorted to the expedient of depressing the pieces, whereby the balls striking the water about fifty yards from the beach, bounded upward and over into the fortress. This was remarkably successful. "These are what I call billiards," said the captain, watching the firing. "They carom on the bay and beach, and pocket the ball in the fort every time."

THE speed of the *Florida*, the rebel cruiser, may be inferred when she failed to catch the *Ericsson*, one of the slowest steamers we have in this port. The *Florida* tried her best to come up, but failed.

THE iron-clad gunboat *Cincinnati*, which was sunk by the rebel batteries at Vicksburg, has been raised and towed to Cairo, where she is undergoing necessary repairs.

THE coolness and audacity of the rebel pirates is astonishing. Quite recently one of them (the *Retribution*) was captured in this port, whither she had come from the West Indies with a load of fruit.

AN iron 36-pounder, which has a history, was captured at Vicksburgh and has been sent to Washington. It was cast in France in 1768, and was brought to this country by Lafayette in 1777. It did good service in the Revolution, in the second war with England, and was used in the Texan war by a company of volunteers from New Orleans, who assisted the Texans in achieving their independence.

UNDER a recent order of the Navy Department, the great steamship *Franklin*, at the Portsmouth naval station, is to be completed and made ready for service. The ship was commenced under the administration of President Pierce.

ONE of the newly-invented southern guns, Brooks' patent, of large calibre, was lately sent from Richmond to Beauregard at Charleston, intended as an offset to the "Swamp Angel." On arrival at its destination it was found to have been spiked by skilful but unknown hands.

ON page 164, Vol. IX of the SCIENTIFIC AMERICAN, will be found an illustration of the torpedoes recently used by the rebels. During one of the assaults, a negro corporal was blown out of our trenches. In the night the rebels siezed the dead body, stripped it, and bound it to a spar, which was connected to a torpedo. This was done in the hope that our men would be foolish enough to come out and carry their comrade away, when they would of course have been destroyed. It is needless to say that the little plan did not work.

DURING the present attack on Charleston, a shot from one of our gunboats struck a cannon in Fort Wagner and stood it on end. Another shot directly after, struck the breach and caused the weapon to make a series of ground and lofty tumblings for a long distance.

QUANTITIES of hook-ended pikes were planted in the embankment of Fort Wagner, to prevent our troops from carrying it by assault. Torpedoes were also thickly scattered about.

DR ANDREW'S flying machine alluded to in last week's SCIENTIFIC AMERICAN, proves to have been a lamentable failure, and the public have been gulled by the misrepresentations and balderdash of the journal which originated the incorrect report of its success. The only successful flight was the flight of fancy indulged in by the enthusiastic devotee of science attached to the Daily at fault.

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ON STRYCHNIA AS A POISON—ITS ANTIDOTE.

The following are condensed extracts from a paper on this subject, by Prof. Mitchell, M. D., of Jefferson Medical College, Philadelphia :—

But a few years ago, no antidote for the poisonous action of strychnia was known, the treatment being purely remedial, and in no sense chemical. The spasms or jerks were often attempted to be controlled by anti-spasmodics. The patients generally died, after a brief period of terrible suffering.

In later years, the use of this poison has very greatly increased, partly because of the smallness of the dose, and partly because of the easy methods of concealing its administration. The multiplication of cases, however, has led to a more perfect understanding of its action, and the means of controlling its fatal tendency. When it is known that a person has taken strychnia, and exhibits tetanic jerks or spasms, the physician should empty the stomach at once by repeated use of the pump, or by means of a prompt emetic, as of ten grains of sulphate of zinc or sulphate of copper, every ten minutes, until the organ is thoroughlv evacuated, and he must not lose a moment in administering the antidote.

Tannic acid and iodine were, for a time, almost the only proper antidotes in use. Both have succeeded, and are therefore reliable. The acid may be given dissolved in water *ad libitum* ; at least an ounce should be put in a quart of water, to be drank freely and largely. The use of it forms an insoluble and inert tannate of strychnia.

The tincture of iodine has also proved decidedly antidotal. Give twenty drops, in mucilage of gum arabic or sugared water, at once, and in ten minutes after, thirty drops, and if need be, forty drops for the next dose. This administration controls the spasms, and the patient is safe.

Camphor has also been found to have an antidotal power. Dr. Claiborne, of Petersburgh, Va., reports the case of a man aged thirty, who took two grains of strychnia. In forty minutes he was laboring under severe jerks or spasms, which continued nearly two hours, almost incessantly. Respiration and deglutition were nearly impracticable. Very large doses of camphor were exhibited, amounting altogether to 60 grains, in less than an hour. Recovery ensued.

Sulphate of morphia is another antidote, and, of course, opium would prove so. In the *Western Lancet*, Dr. Phillips gives the case of a lady who was poisoned by swallowing three grains of strychnia, in mistake for sulphate of morphia. On making the discovery, the lady was placed in a very warm bath, and made to swallow five grains of the morphia salt. The action of the poison was completely arrested, and she recovered.

Chloroform was resorted to by Dr. Jewett, of Boston, in a boy aged fifteen, who in mistake swallowed two grains of strychnia. Medical aid was not procured until half an hour after the accident, when the jerks were violent and deglutition almost impracticable. He was relieved by the inhalation of chloroform, for ten minutes, and partial anæsthesia, kept up for hours, saved him.

D. O'Reilly, of St. Louis, saved a patient fully poisoned by strychnia, by tablespoonful doses of tobacco. Hydro-chloric acid given in milk to a dog poisoned with strychnia, cured it.

The *Vermont Caledonian* stated that ninety grains of strychnia were swallowed by a man, in half a pint of strong gin, without his knowledge that the poison was present. As soon as the discovery was made, an emetic was resorted to, and recovery ensued.

In Sydney, N. S. W., a favorite sheep dog was poisoned with strychnia, and its owner, to put a period to its sufferings, administered a tablespoonful of arsenic mixed with water, when the dog was soon relieved of spasms, and in an hour afterwards had recovered. Thus has been enumerated nine articles, each of which is capable of counteracting the poisonous action of strychnia; these are gin, tannin, iodine, sulphate of morphia, chloroform, tobacco, hydroanic acid, camphor, and arsenic.

As to the query, "How much strychnia will kill an adult?" no fixed answer can be given. Very much depends on the fullness or emptiness of the stomach at the time of swallowing the dose; not a little likewise is due to the previous habits of the patient, the morbid or healthful state of the system, &c. Two men, of the same age and vigor, took each an ounce of laudanum on the same day. Both had medical aid in two hours after the accident. The one died, while the other speedily recovered. The full stomach of the one and the empty stomach of the other, accounted for the difference. The one took the poison an hour before the usual dinner time, the other, an hour after he had dined.

The presence of a potent counter agent in the system is calculated to antagonire a dose of poison. The celebrated Fire King, who deceased a few years since at Hoboken, after taking a dose of liquid chloride of soda, would swallow poisonous hydrocaloric acid, unharmed, in the presence of a crowd of wondering spectators. It is upon the same principle that alcoholic spirit taken until complete intoxication results, is a well known expedient to save life, after the bite of the most venomous serpent. While, therefore, one grain of any known poison might kill an adult in full health and with an empty stomach, another person of the same age might swallow, with comparative impunity, ten or twenty grains of the same poison, under other circumstances.

THE DENTAL CONVENTION.

The annual meeting of the American Dental Association was held in Philadelphia, continuing for several days during the last week of July. Several papers were read, and subjects of general interest discussed. The proceedings are reported in the last number of the *Dental Cosmos:* from which we condense the following, with some comments :—

Dental Physiology.—Dr. Atkinson read a paper on this subject, in which he stated that perverted habits would account for the prevalence of dental disease among the American people ; a well-regulated course of life would secure good teeth and the enjoyment of health. This desirable result would be much promoted by the following rules :—never expectorate, but swallow saliva ; eat regularly and discard lunches ; never eat after weariness and fatigue, before first drinking ; never eat to repletion : keep the teeth and the entire body clean : avoid taking that which is not food : exercise through the day, and take uninterrupted rest at night. Tooth-edgedness was a peculiar sensation connected with dental physiology. It appeared to be due to some nervous sensibility in the enamel of the teeth. Several points in this paper drew forth remarks from the members. Dr. Lyman related the case of a gentleman who was unable to eat anything sour, without using sugar to counteract the tooth-edgedness which it produced. Dr. Sill said he had suffered much from tooth-edge, when young. Upon eating an apple of the Woolman stripe, the sensation of the teeth was almost unbearable, until counteracted by eating a Pearmain, which he supposed contained a great proportion of sugar.

Dental Pathology and Surgery.—A report on this subject was presented by a committee, through Dr. Atkinson. The simplest form of pathological disturbance in the enamel of the teeth is a mechanical separation of its parts. The second change is chemical, and involves the idea of molecular disintegration, and it will go on, serially, as long as the affinity of the solvent for the molecules is greater than that which exists between them for each other. There is also a state of semi-solution and resolidification, which is truly pathological, and is displayed in cicatrices and the reproduction of cellular and osseous structures. The reproduction of bone is a new process. The forms of disease affecting human bones are venereal virus and mercurial influence. Metallic mercury is entirely inert ; its compounds effect systemic impression. When bones are dissolved, and held within the walls of an abscess, recalcification may be obtained and a perfect cure established ; but the new bone produced will be of lower organization than the original. Venereal virus first attacks the cancellated tissue of bones ; when this condition is known to exist, the solution is discharged and iodine and glycerine are employed for dressing. In mild cases the wine of opium is a good application ; but in malignant cases, requiring heroic treatment, a saturated solution of resublimed iodine in creosote should be employed. He described a case in which the upper maxillary and superior turbinated bones were gone, and the middle turbinated bones much inflamed. He first removed the diseased structure, obtained a pocket for the retention of the *plasma*, and by application of the favorite solution of iodine in creosote, succeeded in effecting a remarkable cure. Dr. W. H. Allen could testify to such cases as those described by Dr. Atkinson, in which new bone had been formed. He had himself succeeded in partially reproducing the external plate of two denuded incisors, and had known of loose teeth having been rendered quite firm and serviceable by the treatment described. Dr. Hawes confirmed the statements of Dr. Atkinson, with respect to the reproduction of bone in decayed teeth ; and Dr. Taft related a case of the four superior incisors having been attacked with a continuous abscess, which was cured by the application of tannin, glycerine, creosote aad iodine. The decayed bone was reproduced in the course of three months.

Irregular Extraction of Teeth.—The Convention passed the following resolution offered by Dr. Hawes :—"*Resolved*, That in our deliberate judgment the frequent and indiscriminate extraction of teeth, for trifling, temporary and other wholly unnecessary causes, which has so long and so extensively prevailed, should not only be held perfectly inexcusable, but should be severely censured ; and that an intelligent and patient remedial treatment, for their restoration from disease and permanent preservation, should be the first and highest aim and effort of our profession, and should be most earnestly explained and recommended to the public. And further, that in our belief, the progress of dentistry, at the present day, has revealed resources, varied and ample, when timely used, for the preservation of almost every tooth, so that its decay and extraction shall only be simultaneous with that of the human frame itself."

In this resolution, adopted by the American Dental Association, we have the pledge of a new purpose. A dentist is chiefly held to be an extractor of decayed, and manufacturer and setter of artificial, teeth. We are now told that the science of dentistry has been so improved that almost every tooth may be preserved as long as the human frame endures. Such triumphs in dental science have not yet been dreamed of by the mass of mankind. A new race must grow up to await its blessings, for millions of persons in the United States are now furnished with sets of artificial teeth when they reach the age of about fifty years.

Causes Influencing Abnormal Development of Teeth.—Dr. Sylvester read a paper on this subject, in which he drew comparisons between the teeth of the Aborigines and the present inhabitants of the country. He believed that decay in any tooth was the result of a violation of nature's laws ; 1st, parental influence ; 2d, gestatory influence ; 3d, improper diet ; 4th, impure air ; 5th, want of exercise. Dr. Atkinson thought they were in deep water respecting this subject. Children should indeed receive proper nourishment, and particularly food containing the phosphates. Dr. Buckingham believed that defective teeth were more often the result of *over* than *under* feeding. The use of food containing phosphates insured the production of dense and durable teeth. Dr. Whitney thought the mixture of races was a fruitful source of irregularity in teeth. Dr. Watts believed that a deficiency of phosphates in mothers' milk was a cause of imperfect dental development. He had known a case of a mother who had freely used the phosphate of lime, according to his advice, and her children had finely-developed teeth. Dr. Ellis stated that it was a pernicious habit to breathe through the mouth. His opinion was based upon long and careful investigation.

Treatment of Dental Irregularities.—Dr. N. W. Kingsley expressed his views on this subject. To give a general idea of his method of correcting irregular teeth, he supposed two cases ; one in which an upper central incisor stood within the arch, and another in which the central upper incisors required turning upon their axis. In the former case he fastened a gold band outside of the arch, secured it to the back teeth, and placed a gum-elastic strip around the tooth, fastening it to the band. The contraction of this strip draws the tooth directly into place. In the second case he used the gold band and gum-elastic strips, but made a nick in the wire, in order to retain the elastic bands apart, when tied, and thus give a rotary movement to the tooth. Different opinions

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upon this mode of treating irregular teeth were expressed by a number of members. Dr. Watts, condemned metallic bands and India-rubber appliances for such purposes. Flax was more desirable than rubber, as it contracts to a certain point, and then firmly retains the tooth in position, allowing it time to recuperate. Most of the members, however, were favorable to the use of India-rubber bands. Dr. Searle related the case of a Russian nobleman, whose upper (buck) teeth were very prominent, and caused him great uneasiness. After visiting several dentists of repute, to have the deformity corrected, he applied to Dr. Brewster, who undertook the task, stipulating that his instructions should be implicitly obeyed. He applied a pad upon the back of the patient's head with a ligature passing directly over the front teeth. In eight months the deformity was cured, and when the nobleman returned to Russia his friends did not know him, so great was the change and improvement in his countenance.

Filling Teeth.—Upon motion, this subject was brought up for discussion. Dr. Rogers regarded gold as the sheet-anchor of the dentist; yet in some cases tin-foil was the best material for filling and preserving teeth. It was not desirable for front teeth and upon a grinding surface. Dr. J. A. Perkins gave Dr. Wood's plastic metallic filling the preference over the foil. Dr. Smith recently examined the teeth of a lady, in which were good tin-foil fillings of 34 years standing. Dr. Atkinson held this question to be of paramount importance. He did not believe gold was the best filling material under all circumstances.

Cleft Palate.—This subject was brought up for discussion, by motion, when Dr. Kingsley, of New York, exhibited and explained his artificial vellum. He stated that, by means of his invention, he had rendered the speech of patients, whose conversation it had been impossible to understand, so intelligible that any peculiarity would escape detection, except by the professional ear. Dr. Allen congratulated the profession on the results of Dr. Kingsley's efforts; he had attained to a higher point in this direction than had ever before been reached. A vote of thanks was given to Dr. Kingsley for the description of his method of treating cleft palate and for making a perfectly practical artificial vellum: also a gold prize medal.

Laughing Gas in Dental Surgery.—Upon motion, this subject was brought up for discussion, whereupon Dr. J. Allen stated that he did not advocate the use of any anæsthetic agent, but considered nitrous oxide or laughing gas the most desirable of any that had ever been employed. He had ceased to use ether and chloroform, on account of their danger, and considered laughing gas the most pleasant and reliable anæsthetic agent. It was somewhat expensive and difficult to keep, and this was an objection to its employment. Dr. Searle also preferred it. He applies it with a mouth-piece, and prevents the patient from opening his lips during inhalation. It is always uniform in its effect. Dr. White used it invariably, as made from the nitrate of ammonia. He fused the nitrate of ammonia in a glass retort, upon a sand bath, and passed the gas through a quantity of water sufficient to absorb any nitrate of ammonia which might pass over in vapor without being decomposed. The operation required care and intelligence. Dr. Atkinson said there was not a well-authenticated case of death from chloroform on record, yet he never administered it without apprehension.

Mechanical Dentistry: India-rubber Plates.—Dr. Perkins condemned the use of India-rubber for plates, and Dr. Allen thought its merits were far below gold. Dr. Hawes liked India-rubber, and never saw more than one or two patients who would not pronounce in its favor. Dr. Palmer stated that within three weeks he had substituted rubber for gold in his own case; but it excited a disagreeable heat in his mouth and rendered it insensible to cold. Dr. Holmes avoided the disagreeable heating effect of India-rubber, by drilling holes through it and filling them with gold wire. The profession is not a unit upon India-rubber.

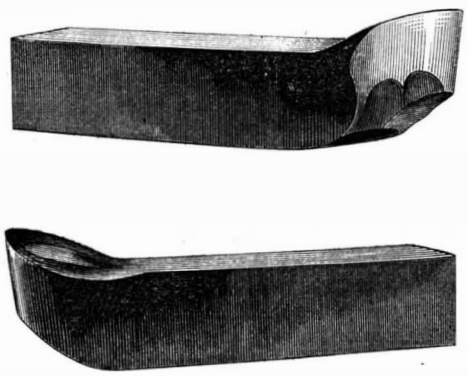
Alveolar Abscess.—Dr. Dwinelle stated that diseases of the antrum are amenable to treatment, when the cause of irritation is removed; its nature is not so well understood by the medical as by the dental profession. In ordinary alveolar abscess, he dries out the pulp cavity, and fills it with creosote dropped from a cotton broach. Dr. Roberts, in one case of alveolar abscess, filled with gold around a pivot of platina, introduced into the root. The operation was performed about six years ago, and the results have been satisfactory.

Diseases of the Antrum.—Dr. Atkinson stated that diseases of the antrum were caused by inflammation. It was not necessary to remove a good tooth to get access to the cavity. A perforation should be made between the fangs of the teeth, as between a second bicuspid and first molar. He uses dressings of salt water, glycerine, iodine, and tincture of arnica. Dr. Kingsley stated that his father had lost a large portion of the bony walls of the antrum, and there was an offensive discharge. He used tonics internally, syringing with nitrate of silver, and succeeded in effecting a cure.

Along with much that was useful, communicated in the papers read, and in the remarks made by the members of the Dental Convention, a great many indefinite and high-sounding, notional views were presented. The dental profession undoubtedly have a leaning to the humorous side of human nature. One of the craft in this vicinity has lately affixed an addition to his shingle, on which is the following declaration of principles and practice:—"Teeth extracted without pain by the application of nitrous oxide (laughing) gas."

A GOOD ROUGHING TOOL.

It is believed that the cutter illustrated herewith comprises the most desirable features of an efficient



roughing tool. For work of the kind mentioned, the instrument must be strong and of the proper shape, that will do the most duty without being dressed, tempered or ground too often. It must also cut freely, so that it will not take more power to drive it through the iron or brass than is necessary. This tool is now very generally used on all heavy work in the best shops, and is so far superior to the diamond-point that it is not to be compared with it for a moment; a trial will convince the most skeptical of the truth of this assertion. It is necessary to have right and left-hand tools for long shafts, so that the turner will not be obliged to run the carriage back to take another cut, and in this feature it is not so convenient as some diamond-point tools ground to cut either way. This tool is much better than the latter, however, in that the edge is inclined in the direction of the cut, and the wedge cleaves and does not bruise or force the metal off, as is the case with the round noses, stub-ended diamond-points, and nondescript cutters of all kinds without a name, that many turners are content to use. The strength of the edge and the chip it will carry, is apparent at a glance, and if the belt will drive the work, the whole cutting face may be engaged without digging in or breaking, provided it is properly dressed and tempered.

Such tools as these are continually used on the largest steamboat and marine engine shafts in the country; these have been turned all over, without one dressing and very little grinding. The tool works with less heat than a diamond-point, for reasons previously set forth, and it is believed by the best lathemen we have in this city to comprise the chief requisites of a roughing tool.

The great wine cask in Heidelberg Castle has found a rival in one just completed at Dover, Eng. Eight couples danced on the top, and its cost was about $1,000.

DISCOVERIES AND INVENTIONS ABROAD.

Imperial Ruby Dye.—A patent has been taken out by R. A. Brooman, London, for producing a new aniline color, which is described as follows:—The color (the normal tone of which is a cerise, or its derivative shade) is obtained by the combination of fuchsine and coralline, or any other yellow or orange color extracted from coal tar products. Process—The fuchsine and coralline are dissolved, together or separately, in methylated spirit, acetic acid, alcohol or other spirit. The coralline predominates in quantity over the fuchsine; thus, to obtain the normal tone of imperial ruby, the inventor takes, say, three parts of coralline to two parts of fuchsine. These proportions, may, however, be varied; any excess of coralline in the dyeing bath tends to produce a yellower cerise, while an excess of fuchsine, on the contrary, imparts a more violet shade; thus, by varying the proportion of one or other of the products, all the gradations of shades of cerise and its derivatives may be obtained.

Belgian Artificial Leather.—In Belgium artificial leather is made as follows:—A certain quantity of gum, as caoutchouc or gutta-percha, cut into small pieces, is softened by subjection to a strong heat; then 80 or 90 parts of scraps of hide or leather of any sort are added. Hair of any kind and shreds of woolen cloths may be added, and intimately mixed with the other substances, by an apparatus heated for that purpose. If the artificial leather is wanted hard, sulphur is introduced while the substances are mixing, in order to vulcanize the gum. The thick paste thus obtained is pressed into sheets, while warm, and afterward rolled to the required thickness.

Photo-lithographic Process.—M. Morvan has addressed a communication to the Paris Academy of Sciences, containing a description of a new lithographic process. He says:—"Upon a lithographic stone, previously coated in a dark place, with a varnish composed of albumen and bichromate of ammonia, I place the right side of the subject to be reproduced, whether the picture be upon glass, linen, or paper. Papier Saxe is naturally to be preferred. But any other sufficiently transparent substance suffices for this operation. This done, I expose the stone to the action of light, from 30 seconds to 2 or 3 minutes only, if in the sunshine; and from 10 to 15 minutes, at the most, if in the shade. At the end of this brief time, I remove the subject and wash the stone, at first in soap water, and next in pure water, and I immediately pass over it an inking roller. The design is already fixed, for the picture begins to reveal itself in black upon a white ground. Then I gum it and leave it some minutes to dry, and the operation is concluded; we can then pass it through the press and print from it.

"It will be understood that the light fixes the varnish and renders it insoluble wherever it strikes upon it; but that, on the other hand, all those parts of the stone shaded by the lines of the original design, remain soluble, consequently attackable by soda and by acid, in addition to what the substance of the soap contains; the action here produced upon the stone belongs at the same time to engraving and to lithography.

"As to the advantages of the process, they may be summed up as follows:—Simplicity and rapidity of operation; exactitude of reproduction; no need of negative cliches upon glass or paper: the positive model comes positive; absolute preservation of the model, intact and immaculate; permanency; at least equal to that of engraving upon stone; and, lastly, the great economy of the process."

Preventing Sea-sickness.—A patent has been taken out by J. Ashe, of Birkenhead, England, for preventing sea-sickness, by attaching a couch or a chair for supporting a person, to a ball and socket joint, fitted to a vertical standard, secured to the cabin floor. The standards used have each a branch or several branches at or near the top, which bend outward, and from each is suspended the spring chair, or couch, connected by the ball and socket joint. The person sitting in such a chair, or reclining on a couch thus suspended and arranged, will always remain in the same position, nearly; and the rolling and pitching motion of the vessel will not be felt. There is a ship's life berth boat exhibited by T. S. Brown, of Greenpoint, L. I., at the Fair of the American Institute, which is suspended, like Mr.

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Ashe's couch, and it is claimed that it will also prevent sea-sickness, upon the same principle. Sailor's hammocks are suspended upon the same system.

New Blue Color.—A patent has been taken out by J. A. Schlumerger, of Bale, Switzerland, for producing a new aniline blue as follows:—He takes rosaniline, and mixes it with three parts of aniline and one and a half parts of acetic acid, adding one part of the carbonate of soda. The mixture is then heated to between 118° and 210° centigrade, and maintained at this temperature until it assumes a blue shade, when examined in a glass tube. The product is then precipitated with hydrochloric acid, being boiled therein, when the color solidifies and may be removed from the vessel with a skimmer. It is next boiled three or four times in water, and yields a blue without any shade of purple. It is then dried and afterwards dissolved in alcohol, when it is ready to use by the dyer. It has been difficult to obtain a pure aniline blue, devoid of a shade of purple; this blue, it is stated, has no purplish tint by sunlight or artificial light.

Improved Magenta Color.—Intense activity is manifested by European chemists, at present, in the production of improved aniline colors. Dr. Dawson, of Huddersfield,England, has obtained a patent for producing magenta, or aniline purple, as follows:—Equal parts of aniline and arsenic acid are mixed together, with about 23 per cent of boiling water. This is placed in a strong iron cylinder capable of withstanding a pressure of 200 pounds on the inch. The lid of the cylinder is now bolted on and the temperature of its contents raised to 350° Fah; and maintained at this heat for twelve hours, when the desired color is obtained. The product is then taken out, washed with water, and is ready to be dissolved in alcohol, in which state it is fit for dyeing. The production of a pure black on silk and wool, with aniline, is much desiderated. It is stated in some of our foreign exchanges, that J. Lightfoot, of Acrington, England, has produced such a black dye, but the particulars of the process have not been published in full. It is only stated, that a salt of aniline is mixed with certain oxides (probably the oxides of iron) as a mordant.

Correspondence

Harbor Defense.

Messrs. Editors:—As much interest is felt in devising some cheap and effectual means for closing the entrances to the harbors of our great cities, I have conceived the following plan and submit it for public consideration, believing that it will be found superior to any heretofore offered.

It seems to be the settled opinion that chain cables are the most effectual agents for the purpose; and it has been proposed to suspend, or sustain the cables near the surface by buoys. This plan is exceedingly ingenious in my estimation; but buoys would scarcely be sufficient to sustain such an immense weight; they are besides somewhat complicated and expensive, and in the end might fail. A simpler, cheaper, and doubtless a much better plan will now be explained.

Let the chain cables be sustained by attaching them to timber supports placed at intervals, standing on the bottom and reaching to a uniform level near the surface of the water. The chains being attached to the supports, all will raise together, and all lower together, lying flat on the bottom when not in use. The gates or supports may be made by pinning heavy plank to upright timbers; similar in construction to ordinary lock gates. The timbers may be from six to twelve inches thick, and the plank three or four inches. As the gates are to vary in hight according to the depth of the water, they should vary in length correspondingly; from twenty to forty feet long and as many high. If not of sufficient weight the spaces may be filled with stones. It will be best to make the upper or city end of the gates somewhat higher than the lower or seaward end, so as to guard against all changes of tide, and cause the attacking vessels to strike the lower chains first. These gates are to have stout rings fixed on their upper edges, through which to pass the chains and to which to attach them when drawn tight. The gates are to be thus made and then sunk at suitable intervals—say three hundred feet apart—clear across the channel, the distance between being less where the water is deepest. The chains being passed through the rings in the gates which lie at the bottom, are drawn tight by a strong windlass attached to each chain, and then securely fastened to the rings. The gates are now drawn up with the chains, using windlasses as the power (or an engine may be used), until they are almost perpendicular, and the chains are a few feet from the surface of the water, uniform from shore to shore. If the gates are not drawn up entirely vertical, they will all drop to the bottom together with the chain, when the raising power is taken off. If drawn up vertical, a few windlasses will have to be placed at the opposite end to lower them. In either case the chains should be securely fastened to the shores, and the fastenings and windlasses protected from injury. If thought advisable the chains may be linked together by bars at intervals, which would make them much stronger and a pressure upon one would be a pressure upon all. The chains may also have torpedoes placed at suitable distances; and the whole may be placed between revolving iron forts, stone forts, or sand forts, and in all respects be similar to the other proposition except in the support of the chains. The number of chains may be five, ten, or even twenty, according to the depth of the water, and the consequent size of the vessels to be resisted. It will be seen that these gates not only furnish a cheap means of sustaining the chains horizontally, but that they also sustain it laterally against the pressure or concussion of the vessels; and as the weight of the gates together with the chains will be immense, it will be next to impossible to raise the chains so as to cut them; while if one is cut it will scarcely impair the strength of the mass. Altogether this would seem to be the cheapest, strongest, and best mode to block up the entrance to harbors, and it is difficult to see how it could possibly fail. Will the authorities of cities or states, and also the national government give this plan their consideration? The iron-clads building in England may be upon us in a month or two; something should be done, and that quickly.

A. Watson.

Washington, D. C., 1863.

[Our correspondent and all others do well in urging the importance of this subject, and we are glad to see attention given to it. We must criticise this plan, however, in some features which have been lost sight of by Mr. Watson; and those are that timber is objectionable for the purpose indicated, as it offers no resistance whatever to submarine operations. In the passage around Island No. 10, by Colonel Bissel, his engineers made nothing of cutting off huge trees, the growth of ages; and in other places, as at Newbern, the impracticability of thus defending the rivers and harbors of the country has been made manifest. The cost of one timber support from 20 to 60 feet long and 12 inches thick would exceed that of an iron buoy, when the labor of preparing it, &c., is considered; and the expense of affixing a timber upright in the channel, and attaching a buoy are not to be mentioned together. The gates and timbers would oppose such an area to the action of the tide as to be practically useless, unless of enormous strength, and they would be eaten up by worms when placed in salt water, unless coppered—an additional expense. The greatest evil, however, lies in the fact that, by the arrangement above proposed, a harbor so defended, is wholly blockaded. This is not at all desirable. What is needed is an impenetrable barrier, and yet of such a nature that it may be placed, removed, or lowered, without injury to the commercial interests of the city defended. Massive chains combine good qualities for this purpose, but they require to be rendered buoyant in some manner, and we think the plan spoken of in "Iron Rafts for Harbor Defense," the most feasible one yet brought to our notice.—Eds.

Phenomena of Camphor in Water.

Messrs. Editors:—I was much interested in your article with the above caption, on page 149, current volume of the Scientific American. I had accidentally discovered the fact of the movement in the following manner. Having used a Florence flask in the Berkshire Medical College, to show to the class the method of forming crystals by sublimation of camphor, two weeks after I poured a little water into the flask for another experiment, when a crystal of camphor becoming detached, began to shoot about upon the surface of the water in an almost magical manner; I at once commenced a series of investigations in connection with Professors Ford and Palmer, of the University of Michigan, and Mr. Johnson, of Pittsfield, Mass., who was assisting me at the time. I could find no account of the phenomena until a friend called my attention to your article last Saturday. I believe we had jointly worked out all there stated respecting it. Professor Palmer at once suggested the same explanation given by Mr. Lightfoot for the main phenomenon. Whether this is the true one may well be doubted. Some experiments now going on will throw light upon this. But some additional points I wish now to make. First, the movement is no test of the purity of the water, though it undoubtedly is a test for certain impurities. The experiment succeeded perfectly in my pneumatic trough, in which various salts had been allowed to accumulate for three weeks from the washings of chemical ware. It also succeeded in lime water, the particles of camphor in some cases actually cutting their way through the pellicle of carbonate of lime which forms upon it. It also succeeded well in strong aqua ammonia, and in water colored with litmus. The temperature of the water seemed to have little influence—warm water and ice water both being tried. In other cases, with apparently pure water and with every precaution, the experiment fails. In such a case if the vessel in which the particles of camphor are floating is slowly tipped upon its side, the particles will commence to revolve; especially if it is inclined enough for a small portion of the water to run over. This process evidently breaks the invisible pellicle which prevents the action. The surface on which the particles move soon loses its sensitiveness if many are thrown in, either being saturated with the camphor vapor, or having lost the element which affected it. The particles certainly waste away quite rapidly, so that the process must be one of evaporation or oxidation. If the floating particles are examined with a microscope, minute bubbles of gas may be seen apparently forming upon them, and the movement especially of the large and round pieces, reminds one at once of sodium upon water, or drops of water in the spheroidal state. The most beautiful phenomenon is witnessed when very fine shavings cut from solid camphor are dropped directly upon the water. As the shavings coil by the cutting, they spin like miniature tops upon the water, with great velocity until they disappear. The selection of partners spoken of in the article is probably only accidental: for small pieces of wood will do the same, as is well known; and these particles will also select wood, or dart against the side of the vessel, as though attracted to it. And when two particles of camphor are thus held together by adhesion fiercely agitated by this constant force, they look indeed like miniature monitors in battle, and even like living things in conflict; and it is natural to suppose without careful examination that there must be some force analogous to magnetism. The length of this article prevents me from giving other experiments and theories. I have written this to give such new facts as are needed for success in trying the experiment; for as you remark, the phenomena are really very striking, and well merit more attention than is generally devoted to such things.

C.

Williams College, Sept. 8, 1863.

A Frenchman has discovered a substitute for paint over plaster. A coat of oxide of zinc mixed with size, and made up like a wash, is first laid on the wall, ceiling or wainscot; and over that a coating of chloride of zinc, prepared in the same manner as the first wash, is applied. The oxide and chloride immediately effect a sort of combination, forming a cement, smooth and polished as glass, and possessing the advantage of oil paint without its disagreeable odor.

Iron which has been burned slightly, by careless heating, may be restored by drawing it out under a hammer at a low heat a number of times.

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Worth Remembering.

The following article from Dr. Hall's Journal of Health, contains practical hints on various subjects, that are worthy of attention :—

1. It is unwise to change to cooler clothing, except when you first get up in the morning.

2. Never ride with your arm or elbow outside any vehicle.

3. The man who attempts to alight from a steam-car while in motion is a fool.

4. In stepping from any wheeled vehicle while in motion, let it be from the rear, and not in front of the wheels; for then, if you fall, the wheels cannot run over you.

5. Never attempt to cross a road or street in a hurry, in front of a passing vehicle ; for if you should stumble or slip, you will be run over. Make up the half-minute lost by waiting until the vehicle has passed, by increased diligence in some other direction.

6. It is miserable economy to save time by robbing yourself of necessary sleep.

7. If you find yourself inclined to wake up at a regular hour in the night and remain awake, you can break up the habit in three days, by getting up as soon as you wake, and not going to sleep again until your usual hour for retiring; or retire two hours later, and rise two hours earlier, for three days in succession ; not sleeping a moment in the day-time.

8. If infants and young children are inclined to be wakeful in the night, or very early in the morning, put them to bed later ; and besides, arrange that their day nap shall be in the forenoon.

9. "Order is heaven's first law," regularity is nature's great rule; hence regularity in eating, sleeping, and exercise, has a very large share in securing a long and healthful life.

10. If you are caught in a drenching rain, or fall in the water, by all means keep in motion sufficiently vigorous to prevent the slightest chilly sensation until you reach the house ; then change your clothing with great rapidity before a blazing fire, and drink instantly a pint of some hot liquid.

11. To allow the clothing to dry upon you, unless by keeping up vigorous exercise until thoroughly dried, is suicidal.

12. If you are conscious of being in a passion, keep your mouth shut, for words increase it. Many a person has dropped dead in a rage.

13. If a person "faints," place him on his back and let him alone ; he wants arterial blood to the head ; and it is easier for the heart to throw it there in a horizontal line, than perpendicularly.

14. If you want to get instantly rid of a beastly surfeit, put your finger down your throat until free vomiting ensues, and eat nothing for ten hours.

15. Feel a noble pride in living within your means, then you will not be hustled off to a cheerless hospital in your last sickness.

Premiums to Civil Engineers.

The following is the list of premiums recently granted by the council of the Institute of Civil Engineers, England, for essays :—

1. A Telford Medal and a Telford Premium, in books, to John Brunton, M. Inst. C.E., for his "Description of the Line and Works of the Scinde Railway." 2. To James Robert Mosse, M. Inst. C. E., for his Paper on "American Timber Bridges." 3. To Zerah Colburn, for his Paper on "American Iron Bridges." 4. To Harrison Hayter, M. Inst. C. E., for his Paper on "The Charing Cross Bridge." 5. A Telford Premium, in books, to William Michael Peniston, M. Inst. C.E., for his Paper on "Public Works in Pernambuco, in the Empire of Brazil." 6. To William Henry Preece, Assoc. Inst. C.E., for his Paper "On Railway Telegraphs, and the Application of Electricity to the Signalling and Working of Trains." 7. To Alexander Woodlands Makinson, M. Inst. C.E., for his Paper "On some of the Internal Disturbing Forces of Locomotive Engines." 8. To Daniel Miller, for his Paper on "Structures in the Sea, without Cofferdams, with a Description of the New Albert Harbor at Greenock." 9. To Robert Crawford, Assoc. Inst. C.E., for his Paper on "The Railway System of Germany." 10. To William Cudworth, M. Inst. C.E., for his Paper on "The Hownes Gill Viaduct, on the Stockton and Darlington Railway." 11. To James Grant Fraser, M. Inst. C.E., for his Paper "Description of the Lydgate and of the Buckhorn Weston Railway Tunnels." 12. A Watt Medal and the Manby Premium, in books, to John Fernie, Assoc. Inst. C.E., for his Paper "On the Manufacture of Duplicate Machines and Engines."

It has frequently occurred that, in papers which have been considered deserving of being read and published, and have even had premiums awarded to them, the Authors may have advanced somewhat doubtful theories, or may have arrived at conclusions at variance with received opinions. The Institution, as a body, are not considered responsible for the facts and opinions advanced in the papers ; and such papers have medals and premiums awarded to them, on account of the science, talent or industry displayed in the consideration of the subject, and for the good which may be expected to result from the discussion and inquiry.

The third premium on the above list was awarded to an American—Mr. Zerah Colburn—whose paper has been published and highly commended.

Great Eaters

Never live long. A voracious appetite, so far from being a sign of health, is a certain indication of disease. Some dyspeptics are always hungry ; feel best when they are eating, but as soon as they have eaten they enter torments, so distressing in their nature, as to make the unhappy victim wish for death. The appetite of health is that which inclines to eat moderately, when eating time comes and which, when satisfied, leaves no unpleasant reminders. Multitudes measure their health by the amount they can eat ; and of any ten persons, nine are gratified at an increase of weight, as if mere bulk were an index of health ; when, in reality, any excess of fatness is, in proportion, decisive proof of existing disease ; showing that the absorbents of the system are too weak to discharge their duty ; and the tendency to fatness, to obesity, increases, until existence is a burden, and sudden death closes the history. Particular inquiry will almost unvaryingly elicit the fact, that a fat person, however rubicund and jolly, is never well ; and yet they are envied.

While great eaters never live to an old age, and are never, for a single day, without some "symptom," some feeling sufficiently disagreeable to attract the mind's attention unpleasantly, small eaters, those who eat regularly of plain food, usually have no "spare flesh," are wiry and enduring, and live to an active old age. Remarkable exemplifications of these statements are found in the lives of centenarians of a past age. Galen, one of the most distinguished physicians among the ancients, lived very sparingly after the age of twenty-eight, and died in his hundred and fortieth year. Kentigern, who never tasted spirits or wine, and worked hard all his life, reached a hundred and eighty-five years. Jenkins, a poor Yorkshire fisherman, who lived on the coarsest diet, was one hundred and sixty-nine years old when he died. Old Parr lived to a hundred and fifty-three ; his diet being milk, cheese, whey, small beer, and coarse bread. The favorite diet of Henry Francisco, who lived to one hundred and forty, was tea, bread and butter, and baked apples. Ephraim Pratt, of Shutesbury, Mass., who died aged one hundred and seventeen, lived chiefly on milk, and even that in small quantity ; his son Michael, by similar means, lived to be a hundred and three years old. Father Cull, a Methodist clergyman, died last year at the age of a hundred and five, the main diet of his life having been salted swine's flesh (bacon) and bread made of Indian meal. From these statements, nine general readers out of ten will jump to the conclusion that milk is "healthy," as are baked apples and bacon. These conclusions do not legitimately follow. The only inference that can be safely drawn, is from the only fact running through all these cases —that plain food and a life of steady labor tend to a great age. As to the healthfulness and life-protracting qualities of any article of diet named, nothing can be inferred, for no two of the men lived on the same kind of food ; all that can be rationally and safely said is, either that they lived so long in spite of the quality of the food they ate, or that their instinct called for a particular kind of food ; and the gratification of that instinct, instead of its perversion, with a life of steady labor, directly caused healthfulness and great length of days. We must not expect to live long by doing *any one thing* which an old man did, and omit all others, but by doing *all* he did ; that is, work steadily, as well as eat mainly a particular dish.—*Hall's Journal of Health.*

Cruel Treatment of Operatives.

The outrages of English taskmasters upon their employés have furnished many a paragraph for journals, at home and abroad, but if the rules exceed the injustice and harshness of those imposed upon the young women in a cotton mill at Auburn, N. Y., they must be severe indeed. A writer in a weekly paper says :—

"A word for the poor girls who work in this mill : their situation touched me deeply. I will not mention their wages—indeed, they are not worth mentioning—but their long-suffering is worthy of record. These girls have to work twelve hours a-day, summer and winter. They are allowed half an hour at noon to take dinner—no more. But this half hour is not bestowed upon them, because they must work twelve hours a day. The half hour which is thrown away at noon, has to be brought back again in the evening. So that those who do not bring their dinner with them in the morning, have to work twice for it—once in running for it, and once in working up the time it took them to run for it. Poor girls! their dinner is seldom worth the running for, and at best they have more to do for it than it is all worth. Some take their dinner with them in the morning and eat it in the mill ; but most of them, unencumbered with hoops or shoes, are extremely supple, make excellent racers, and prefer going home to dinner."

Bees.

In September and October bees are very apt to rob each other, and many families of them have been destroyed in this way. The remedy is to lower the hives down and give but one passage way, and that not over two inches long for the strongest families, and to be contracted, according to the strength of families, down to a compass that will only admit a few bees to pass in and out at the same time. This is the *preventive* remedy. The populous hives well filled with honey will require but little protection, but those hives that have been left weak by too much swarming, or from any other cause, are in danger. Whenever an unusual bustle is noticed around a hive, with dead bees on the ground in front, and the occupants of the hive around in squads on the alighting board, with stronger bees held as prisoners, you may know there is danger. Numbers of bees will be slowly flying around on a level with the entrance, as if seeking for an unguarded passage, making a louder noise than usual. At twilight, when all other hives are quiet, bees will be seen to leave a robbed hive and fly away to their houses. This is the most sure test. In such a case, close the hive entirely for a day, but give the bees air. You may then open the passage way a very little, so as to allow a single bee to pass. Leave it thus for a day or two, when it may be enlarged if no further trouble is apprehended.—*American Stock Journal.*

Before Charleston.

The struggle for the possession of this city still goes on between our forces and the rebels, from the islands and the iron-clads in the bay ; thus far successfully. The army under the able generalship of Gillmore, and the iron-clads, are each endeavoring to subdue the rebellious foe, and are making encouraging progress. In relation to the monitors themselves, there can be no criticism upon their value as impenetrable and serviceable ships for war purposes. Day after day they engage the heaviest ordnance, and go into and come out of action without material damage ; their turrets are bruised all over with honorable scars, but they are still in good order. The sneers and sarcasms of the ignorant are hushed in view of their success. The *Ironsides* also has done good service ; although we are not of those who believe that class and type of iron-clad impenetrable in close action to the latest rifled guns, there can be no denial of the fact that this vessel has acquitted herself nobly, and that the officers and crew have done all that could be expected of them.

We hope to hear before many days that the way to the city of Charleston is open, and that the grim and sullen-looking little monitors have their guns covering it, so that further resistance will be useless.

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Improved Field Fence.

The invention herewith illustrated consists in an improved method of fastening the posts of a fence to the ground; and also in a novel and stable foundation for the same, with braces so constructed and set as to make the whole structure unlikely to be injured by climatic changes. The plan adopted to obtain these ends is, it is believed by the inventor, a good one, and a strong, durable and economical fence is thereby secured. The mode of construction can be applied to both portable and permanent fences. The subjoined engravings fully illustrate the several details. The posts, A, in Fig. 2, are shown as set upon a stone foundation, while in Fig. 1, they rest upon tiles, or blocks of cement, concrete or analogous substances; connected with these posts are the diagonal braces, B, the ends of which rest on the common foundation, while the tops are notched and

Fig. 1

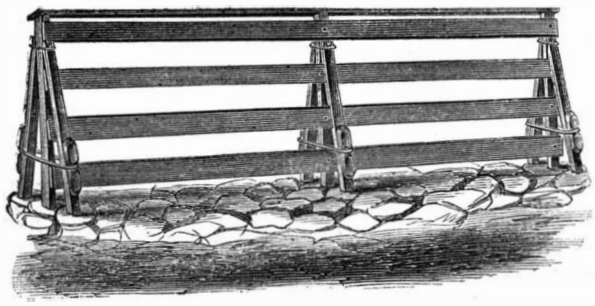
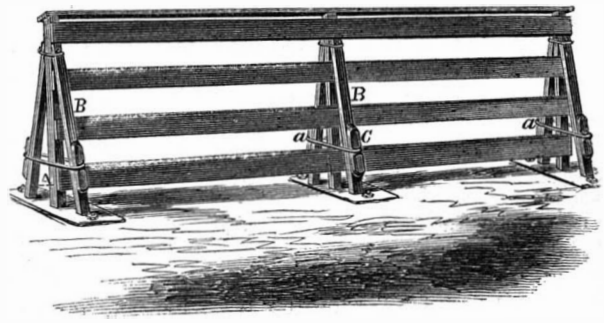
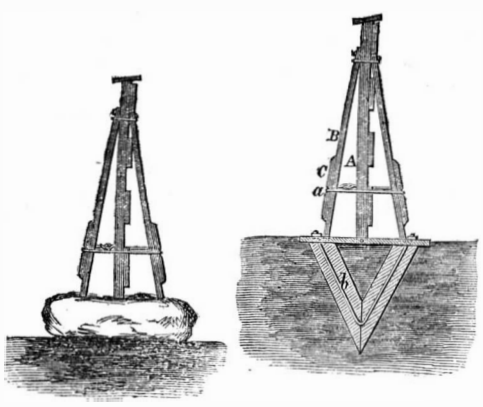


Fig. 2



SMITH'S IMPROVED FIELD FENCE.

received by a wooden, or metallic pin, running through the uprights, A. The upper ends of these braces are bound with a wire, so that they cannot be displaced; and on the lower part, near the bottom, there is a cleat, C, on each, which also receives a wire, *a*, as shown in the engraving. This mode of attaching the fastenings can be varied in the case of permanent fences, and bolts substituted instead of the wires. Fig. 3, below, is an illustration of the foundation of the fence in section. The V-shaped structure being made of cement or tile, as before-mentioned, a hole is dug in the earth and the foundation placed therein, connected together by the



tie rods, *b*, seen passing through the middle. The intervening space is then rammed down with earth or clay, and the whole superstructure is safe against elemental disturbance. In the other view, in the same figure, the fence is represented as set upon a common boulder, such as abound in most parts of the country. The inventor claims that the several arrangements of this fence are convenient and desirable, and that the structure is a valuable one for the objects intended.

The patent for this invention is pending, through the Scientific American Patent Agency, by Charles R. Smith, of Haverhill, N. H. Further information can be had by addressing him at that place.

ITALIC LETTER.—The invention of what is called *Italic*, in printing, was made by Aldus Manutius, an Italian, about the year 1550. For some time after its introduction it was distinguished by the name of its inventor, and called the Aldine. Learning owes much to this eminent scholar and printer—and ignorance too, for this particular service. The writers are numerous who would be nothing without it. Where would be their strong points in argument, for their emphasis in expression! Who could tell, when they try to be funny, where the laugh should come in!

THE BOLTS IN THE MONITOR TURRETS.

A paragraph on page 165, No. XI., of the SCIENTIFIC AMERICAN, called attention to the defective manner of fastening the plates in the monitor turrets, and suggested the hope that inventors would turn their attention to remedying the evil. In response to this call we have received many letters from different persons, all mentioning plans for preventing loss of life from the cause alluded to. Among some of these are the following. The turret should be constructed of wire netting in several thicknesses, in all eight inches, or more, the whole to be well saturated with coal tar. It will be perceived that here bolts are needless, a most summary method of avoiding the trouble. Another plan suggested is to construct the bolts of a tapering form that they cannot be forced in by the shot; still another inventor says that by tapping the holes in the turret and screwing the bolts into them the danger will be obviated. A plan is also forwarded to us wherein india-rubber washers are placed under the bolt heads and iron shields over the nuts inside, said shields being secured to the turret body by tap bolts.

A correspondent, A. H. Fleury, of Philadelphia, directs our attention to a patent recently granted to Gervase B. Maurey, of Danville, Pa., for an improved plan of building up turrets, to avoid danger from the flying bolts, &c. The turrets are to consist of tongued and grooved bars, rivetted together in the center, or inside of each bar, in such a manner as to make a continuous joining of all bars used in the work; they are laid lengthwise, or horizontally, and, as a consequence, present a smooth solid surface externally. The rivets running through them, perpendicularly, are placed three inches, more or less, according to the thickness of walls, from the surface. There can be no exposure of the rivets to shot or other projectile striking the side or surface of the vessel or fortification constructed of such bars. Mr. J. L. Jürgens proposes to build a turret of three different layers; one of wood and two of iron bars, standing in a vertical position, with cotton, india-rubber, or other elastic material interposed. The inner (wooden) strata to be stationary, the yielding to be increased outward, and the curved gully's in the cap and step, for said bars, to be increased proportionally, according to the yielding of the elastic material.

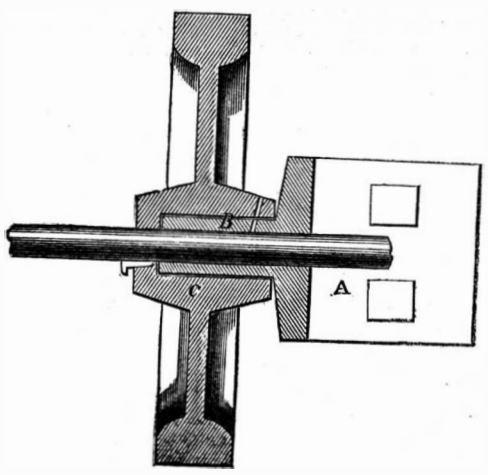
Most of these plans are good and useful; we except however the saturated turret as being an innovation quite beyond contemplation. We have also purposely omitted the names of the several inventors, so that should they choose to bestow more time and attention upon their ideas they can do so without publicity. All of the correspondence on this subject breathes the most ardent loyalty, and expresses desires that the lives of the brave defenders of the country may not be uselessly imperilled; a fact as pleasing to notice as it is creditable to inventors. Much has been done in arousing the inventive mind to the importance of this subject, and we hope the matter will not be allowed to rest until some excellent plan is adopted by the Government.

New Photographic Fixing Agent.

The Paris correspondent of the *Photographic News*, England, states that M. Davanne has called the attention of our Photographic Society to the advantages offered by the employment of sulpho-cyanide of ammonium. The observations he communicated are the result of experiments performed by M. Lewitsky and himself. Both have for several months made almost exclusive use of this new salt. They have proved that if it is slower in action than hyposulphite, it does not attack the thinest film of silver deposited, and that the proofs fixed by it are superior to those treated with cyanide. M. Lewitsky recommends the employment of a very strong solution, containing at least 50 per cent. of the salt. M. Davanne applied this mode of fixing to the *clichés* upon albumenized collodion (Taupenot's process) specially, and in consequence had nothing to fear from the albumen curling up, as was frequently the case previously. Practice, therefore, confirms the hopes that early experiments raised, and as M. Davanne observed, the great reduction in price already made by manufacturers, secures an extended use for this product. The sulpho-cyanide of potassium possesses the same qualities as the salt of ammonium, without any of the inconveniences attendant upon the latter.

BRINKERHOFF'S PATENT HANGER.

This invention relates to an improved method of



hanging balance wheels, or those intended for belts, by which the shaft is relieved of strain and the same thrown on to a rigid and unyielding structure. It is well known to all mechanics that heavy or wide-faced belts running on pulleys fastened to a small shaft, spring the same and tend to draw it out of line; causing it to pound and wear the box very fast. This evil is guarded against by substituting the hanger above illustrated for the ordinary one. It will be seen by referring to the engraving that the hanger, A, has a cylindrical stud, B, turned up on it, over which the wheel, C, is fitted. The wheel is keyed to the shaft as usual, but the bored-out portion runs on the stud, while the shaft itself has also a bearing through the body of the hanger as usual. By this method the labor on the shaft is reduced, and the wheel runs better than without the support it receives from the additional bearing. Patented through the Scientific American Patent Agency, on March 31, 1863, by Jacob Brinkerhoff, of Auburn, N. Y.; further information can be had by addressing him at that place.

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VOL. IX, NO. 13...[NEW SERIES.].....*Nineteenth Year.*

NEW YORK, SATURDAY, SEPTEMBER 26, 1863,

IRON FOR MOLDING.

In founderies where the castings are made of pig-iron, the qualities of which are well known, the task of managing the cupola or melting furnace, and running the metal, is comparatively easy. But in founderies where cheap castings are produced and a variety of work manufactured, the management of the melting furnace is more difficult, and much practical skill is necessary to mix and heat the iron. In such founderies large quantities of cheap fusible scrap-iron, in the form of old pots, grate bars, retorts, &c., &c., are necessarily used. The qualities of such iron differ greatly. Some scraps are hard, others soft, and most of them contain much oxide and impurities. Old gas retorts are almost as difficult to fuse as wrought iron, and they generally require to be mixed with some iron that melts easily and flows freely. Some kinds of scrap-iron require a flux to unite with the oxide and impurities. Oyster shells are usually employed for this purpose. They are chiefly composed of lime, and by uniting with the impurities they form a black slag, which floats upon the surface of the molten metal, and has to be removed by an iron rod, which is stirred into the ladle, the slag adhering to it like glass to the iron rod of a glass-blower. A very intense heat is also required to fuse certain kinds of scrap-iron, and much care must be exercised in selecting coal of the proper quality for this purpose. The graphine or hard carbon which forms in the interior of iron gas retorts, is the best known substance from which to obtain an enduring heat of high intensity in a cupola. For melting some fractious kinds of scrap-iron, some molders would give double the price for a tun of graphine that they would for the same weight of anthracite. This substance has now ceased to be used, because it has ceased to be made, owing to the general substitution of clay for iron retorts. A suitable substitute for it would be a great benefit to many foundery establishments. Old scrap-iron is more commonly employed in some founderies in the vicinity of cities, because it can be obtained in large quantities in such situations. We received a communication lately from the proprietor of a foundery in a country village, who stated he had been unable to use scrap burnt iron, such as furnace bars, &c. Old furnace bars of locomotives are much prized by some of the molders in the city, as they are generally made of good iron, and are not so much burnt as other grate bars. Burnt iron, as it is called, is difficult to melt; it requires a flux of oyster shells or lime, and an intense heat in the cupola. For fine castings, scrap-iron cannot be used with safety, unless the scraps are of uniform quality and their character well known. An experienced molder is competent to form a very accurate opinion of the nature of iron, from an examination of its grain, but the most skilful admit that there are so many different kinds of iron, they are frequently puzzled, and make mistakes as to their fusibility and capacity of flowing into molds.

THE CIGAR STEAMER—STEAM RAMS.

Upon the subject of the best defences for the nation, the Philadelphia *Ledger* says :—

"An inventor in the SCIENTIFIC AMERICAN, proposes a cordon of revolving iron-clad towers for harbor defense, placed so near each other that as soon as a vessel gets out of the range of the guns of one it will be in that of another. This plan, or floating batteries arranged in the same way, seems to be a better security for harbors than stone forts. But a better security than all would be swift-steaming, powerful rams, constructed on the plan of the Winan's steamer, cigar-shaped, the best for strength and speed. A whole fleet of attacking vessels could be destroyed by one such ship. It is singular that the Government has never given sufficient attention to the peculiar construction of this vessel; but we suppose it is only another instance of how hard it is to introduce a principle which revolutionizes established systems, and requires a change in fixed habits and old ideas."

So far as we have been able to ascertain, the Winan's cigar-shaped steamer, which was illustrated and described on page 65, Vol. XIV (old series) of the SCIENTIFIC AMERICAN, was a failure, as predicted in an article on page 109, same volume. The form of the cigar is not the best for a common steamer, and is very objectionable for a steam ram. In this connection we cannot forbear stating that the great projecting iron wedges, called horns, which have been secured to the bows of several armor-clad vessels, to act as rams, appear to be objectionable. In striking with a slanting blow they will either be bent or broken, or if one strikes square and enters the side of an armor vessel, it will stick fast and fill up the breach. Steam rams should be constructed with straight vertical stems of great strength, for the purpose chiefly of crushing in the sides of an enemy. They should have a speed which can only be secured by great steam power. Steam rams of moderate size can be turned with greater facility than very large vessels, either to strike or avoid being struck by a huge opponent.

COAL-MINING MACHINES WANTED—INVENTORS TAKE NOTICE.

The extraordinary price which is demanded for coal directly affects the interests of every person. That the rates at which it is held are not warranted by the ordinary standards of value is quite apparent, and there can be no reason for the extortion other than the monopoly enjoyed by the miners, or the avarice of those who control the market. Whatever the nature of the obstacle to cheap fuel, or the obtaining coal at prices correspondent to those demanded for the other necessaries of life, there is no question but that the door for another invention is here open, and that he who produces a successful coal-mining machine will reap a splendid reward for his talent. We have before us at this writing a letter from a firm in Pittsburg, Pa., which says :—

"You will be doing our city and its neighborhood a very special favor, if you will call the attention of inventors to the necessity now existing, and daily becoming more imperative, for some kind of an engine for digging coal. It is an inviting field, and fortune most surely awaits a successful effort. The coal-diggers are now charging 4 cents per bushel, and are threatening to turn out for 5 and even for 6. At 2 cents, a skilful digger could make $4 per day.

"Prevail upon some of the ten thousand ingenious and benevolent men with whom you are hourly brought into contact, to come to our relief, if you can."

Coal-mining machines are, or have been, used in England with success, and so great is the interest with which this subject is regarded here, by those concerned in coal mines, that one gentleman who came to this office quite recently inquiring for a machine of the kind in question, was obliged to leave unsatisfied, and he is now in England endeavoring to obtain suitable apparatus. This country should rely upon itself for mechanical assistance in all arts and manufactures, and we feel confident that when the fertile brains of our inventors set to work upon the task, there will be no lack of coal-mining machinery. The practical nature of the requirements of such machines are well-known to many ingenious men, and if those who are directly interested will send forward the chief points desirable, whether heavy or light, to strike rapidly or slow, portable or permanent, to be driven by steam or by air compressed by steam, whether with drills or picks, &c., we will lay them before the inventors of the country without delay. When the machines are in operation we should have cheap fuel, because it can be purchased independent of strikes, scarcity of labor, drafts, and kindred complaints held *in terrorem* over the heads of the public, to make them believe coal is worth in this city from $7 50 to $8 50 per tun in summer, and a corresponding advance as the distance from the mines increases.

GREAT ELECTRIC ILLUMINATION.

The last number of the *American Journal of Science and Art* contains a communication from Professor W. B. Rogers, giving an account of his observations on the vast power of the electric light exhibited by Mr. Ritchie on the 6th of August (Thanksgiving) in Boston. The battery used on the occasion contained 250 of Bunsen elements, each an acting zinc surface of about 85 inches, grouped in battalions of fifty. It was arranged in the dome of the State House, with a photometric apparatus. As a standard of comparison with the electric light, a flame of kerosene was cast upon a photometric screen, equal to 200 sperm candles. By a series of observations the carbon points illuminated by the electric current were found to have a force varying from 52 to 61 times greater than the kerosene lamp with its reflector, thus making its illuminating power equivalent to from 10,000 to 12,200 standard sperm candles, pouring their light from the same distance upon the surface of the screen. This was the effect of the electric light sending its rays equally in all directions upon the luminous center, and was vastly short of the collected rays which stretched like the tail of a comet from the surface of the great reflector. Professor Rogers says :—"Judging from some recent experiments on the power of such a reflector to augment the intensity of the light emanating from its focus, there can be no doubt that along the axes of the cone, when brought to its narrowest limits, the illuminating force of the carbon light as displayed on the State House, could be rivalled only by that of several millions of candles shining unitedly along the same line." The only previous experiment of precisely the same kind was made by Bunsen with 48 elements, and the photometric equivalent of his carbon light was but 572 candles or 12 candles to the cell.

INCOMPREHENSIBLE FOLLY.

There is no folly more to be reprehended than the practice of trifling with machinery. We have seen grown men standing near gearing in rapid motion, place their fingers on the teeth and pull them off again just as they were about to be drawn in. We have also seen boys take hold of belts that were thrown off the lower pulleys still running loosely on the upper ones, and ride up to the ceiling, or as near it as they could. We have been witness to other acts of so-called smartness, such as putting a hand under a trip hammer and snatching it away again before it was harmed, which called forth no feeling but one of amazement that individuals should so recklessly imperil their lives and limbs. Don't try to play with machinery; either in motion or when at rest. Forty hair-breadth escapes may result at the forty-first trial in maiming, mutilation or sudden death. Keep the fingers, hands, arms, legs and hair away from rough shafting, and take care that clothing does not get drawn into rapidly-running belts and pulleys. Quite recently a young girl was instantly killed at the India Rubber Works in Newark, N. J. She had been at work during the evening, and after putting on her bonnet to go home, jestingly remarked that she would have a ride upon a shaft which projected about a foot through the floor, if it broke every bone in her body. The shaft was midway between two upright posts about three feet apart, and was turning round quite slowly. She sat upon it, but her hoops becoming entangled she was dashed against the posts, and before she could be rescued, was killed, nearly every bone in her body having been broken.

Men have lost their lives, ere now, while working at turning lathes, by the loose ends of their cravats licking around a roughly-turned shaft; thereby strangling them before aid could be rendered. In many factories huge belts run through openings in the floors, without the slightest protection to prevent a person's feet from being drawn in; and in the large machine shops in this city, there are back gears of huge lathes, revolving at about arm-hight, in the very place of all others where a careless step

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would precipitate one into the jaws of a horrible death. In how many others of the busy workshops of the land is the same state of things tolerated? By far too many. The operatives should insist on having these pitfalls, and mantraps, properly guarded. before some unwary individual is snatched away forever. It also behooves every one to be extremely careful, when in the neighborhood of powerful machines, so that they may not be injured beyond recovery by momentary heedlessness.

PRESERVATION OF FRUITS.

We have recently received several letters from correspondents requesting information relating to the preservation of fruits. One correspondent says:—"The directions which accompany self-sealing jars are usually very ambiguous and laconic. For instance, one says, 'use syrup,' but does not state the amount of sugar. Others give the quantity of sugar but not the water. If the reasons for the several steps were given, it would aid me in performing them and prevent failures."

In the preservation of fruit the great objects to be secured are the exclusion of air and the prevention of fermentation. Sugar is the chief agent employed as a syrup to exclude the air from the fruit, and it is a powerful antiseptic.

Peaches, plums, and such like fruit, may be preserved as follows:—Sound fruit is first placed in a glass or glazed stoneware vessel, then boiling-hot syrup, composed of one pound of white sugar to one pint of water, poured in slowly until it covers the fruit. Air bubbles will rise for a few seconds afterwards; when these cease, the cover, which should be air-tight, is then put on, and the jar put away in a cool, airy situation. Any number of jars containing fruit may thus be operated upon at the same time. The covers of these may be rendered air-tight by the use of India-rubber under the flange, or pieces of cloth coated with wax. Of course the syrup should reach to the lip nearly, so as to avoid an air-space near the top.

As sugar is very high in price at present, the making of preserves, such as jellies, is very expensive. A more economical and superior method of preserving fruit, whereby its original flavor is secured, has been communicated to us by a friend, who has practised it successfully for several years, and whose family has entirely ceased to make old-fashioned preserves:—First obtain a requisite number of common wide-necked bottles, then take the peaches or other fruit to be preserved, peel them, take out the stones or seed, and slice them as for eating at the tea-table. The bottles are now filled with this sliced fruit, and about an ounce of white sugar placed on the top in each. The bottles are then placed in a kettle containing water and held vertical with a frame of slats, then submitted to boiling for about twenty minutes. Each is then lifted, and a cork at once driven into its neck. After this the corks are covered with a composition of equal parts of hot rosin and sealing-wax, to render the bottles air-tight. Fruit thus put up will keep in a cool dry pantry for a year, and retains all its original flavor. Peaches, apples, pears, cherries, blackberries, plums, grapes, &c., have been preserved by this simple and economical system.

A common method of preserving green corn to make succotash during winter, is to boil it slightly in the ear, then remove the kernels from the cobs with a sharp knife, dry them slowly, and pack in air-tight cans. Green corn, Lima beans, peas, &c., may be preserved by drying them slowly, at a low heat, until all their moisture has evaporated, after which they are to be packed in stoneware or glass jars, and put away in a dry pantry. The best method of conducting the operations is to place the corn, or beans, in shallow plates, and arrange them around a stove, or in a moderately warm oven, until they are thoroughly dried. When required for use, they should be steeped in warm water for about an hour before they are cooked. Beans and corn are very difficult to preserve in a moist condition in air-tight jars.

By a singular error of the printers on one of the city papers, the gunboat *Hartford* is described as a steamer of 28 tuns and 1990 guns; and the *Tennessee* as one of 4 tuns and 1275 guns, and so on through a long list.

ALUMINUM BRONZE.

A very interesting article on this subject, in *Newton's London Journal of Arts*, contains information which we here condense, knowing that it will be useful to many of our readers:—Mixed with small quantities of the common metals, an alloy of aluminum is brittle as glass. But a few years since Dr. Percy made an alloy with aluminum and copper, which possesses great beauty and remarkable tenacity. It is composed of copper, with about 10 per cent of aluminum. It is an essential condition to its successful production, that copper of great purity be employed in its manufacture, and the best for this purpose is the kind which is deposited by galvanic action; the next best is obtained from Lake Superior. The melting of the alloy is a matter of much importance. By the first melting, when the two metals are fused together, the product appears to be an intimate mechanical, rather than a chemical combination of the metals, and it is very brittle. But by repeated melting a chemical compound appears to be produced, which is free from brittleness and about as hard as iron. This alloy is tenacious, malleable, rigid, light, and of a beautiful golden color.

It is well adapted for articles of ornament, on account of its capability to receive impressions from dies, and of being chased like gold; while it is insusceptible, in a great degree, to the action of sulphur and oxygen. It affords an artist the means of imitating the effect of gold, as in chased work; it presents a richness of effect similar to gold, and in polished work it is almost as brilliant.

With respect to its adaptibility for mechanical application, in tenacity and rigidity it will compare favorably with many other alloys. In experiments made with it by Mr. Anderson, at the Royal Gun Factory, Woolwich, England, it exceeded the best gun metal in tensile strength in the ratio of 2 to 1. It sustained a strain of 73,183 pounds on the square inch; gun metal (copper and tin compound), 35,040 pounds, and the best steel, 72,000 pounds. In resisting compression it has a crushing force of 132,000 pounds; thus exceeding cast-iron, the resistance of which is about 120,000 pounds. In transverse strength or rigidity, it exceeded gun metal in the ratio of 3 to 1, and brass in the ratio of 44 to 1. It is easily melted, and flows freely; hence it is a good founding metal for castings, and it can be turned in a lathe, or filed, as easily as bronze. It can also be rolled into sheets; but it does not solder well, which is an objection to its use for many purposes. The weight of the bronze is about the same as wrought-iron, which it surpasses in strength. For philosophic apparatus, it is a valuable alloy, on account of its beauty, strength, and freedom from oxidation. At present the price is about $1 45 per pound, which is too high for its employment except in ornamental work, fine instruments, and apparatus. We hope that improvements in the manufacture of aluminum may lead to a reduction in the cost, so that this alloy may soon be obtainable by mechanics for use in place of bronze and brass.

Mutilated Treasury Notes.

No little complaint has been made because of the refusal of the Post-office to receive the worn and mutilated treasury notes and postal currency. The Government should provide that the collectors and postmasters receive this paper, and exchange dirty and mutilated notes, upon the same principles and with the same liberality that well-conducted banks treat their mutilated notes. The mutilated notes so taken by collectors and postmasters, should be embraced in their returns to the Government, and then destroyed. At present the only mode of exchanging this currency is as follows:—

"Mutilated notes and fragments will be redeemed only at the treasury of the United States at Washington, whither they can be sent, addressed to the treasurer of the United States, by mail, free of postage. A draft on the assistant treasurer, at New York, for the amount allowed, will be returned, in the same way, to the address of the person remitting the same. Mutilated fractional notes presented for redemption must be in sums of not less than three dollars of the full face value.—*Legal and Insurance Reporter.*

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week. The claims may be found in the official list:—

Revolving Fire-arm.—This invention consists in so combining two barrels with one rotating, many-chambered, revolving cylinder, in a fire-arm, as to provide for the discharging of two of the chambers of the cylinder, one through each barrel, without rotating the cylinder between the discharges. It also consists in so combining two hammers with each other and with the many-chambered cylinder of a fire-arm in which two barrels are combined with such cylinder as above-mentioned, that one of the hammers may be cocked separately for firing from one chamber or both may be cocked together for firing from two chambers, and that when one hammer only is cocked the cylinder may be caused to rotate only a distance corresponding with the distance between the center of one chamber and the center of the next one; but that when the two hammers are cocked together the cylinder may be caused by the cocking movement to rotate twice the aforesaid distance. And it further consists in certain means by which the combination of the two hammers with the trigger and with the device for effecting the rotary movement of the cylinder to operate, as above described, is effected. H. D. Ward, of Pittsfield, Mass., is the inventor of this improvement.

Fire-arms.—The principal object of this invention is to provide for loading the chambers of the cylinders of revolving fire-arms in front with metallic cartridges of the common form and construction, that is to say containing a fulminating priming in a hollow flange, projecting circumferentially from the rear portion of the shell; and to this end it consists in providing the chambers with lining, thimbles, or tubes, of a proper internal caliber to receive the cylindrical portions of the cartridges, and of an external circumference equal to that of the flanges of the cartridges; the chambers being bored sufficiently large for the reception of the said tubes, and being partially closed or provided with suitable stops in the rear te prevent the cartridges from slipping through. Another object of this invention is to provide for loading with loose powder and ball when the metallic cartridges have given out, or cannot be obtained, and to this end it consists in fitting the rear ends of the said thimbles on tubes with nipples which can be inserted and removed at pleasure. The invention is also applicable to breech-loading fire-arms, so called, which receive their charges in front of the chamber. The above improvement is due to John H. Vickers (assignor to himself and Lucius W. Pond) of Worcester, Mass.

Harbor Defense.—This invention consists in the employment as a harbor defense of one or more vessels provided with ports, through which they may be filled with water for sinking them across the mouth or channel of the harbor, and with pipes through which the water may be pumped out when it is desired to raise and remove them, and having erected upon them parapets or other superstructures which may project above the water when the vessels are sunk, and serve, in addition to the hulls or bodies of the vessels themselves, as obstructions to an enemy's vessels, and also serve for the mounting of guns or as places for sharp-shooters. It also consists in the employment in combination with such vessels and superstructures of a series of floats arranged between, them and screwed thereto by chains or cables for the purpose of serving in part as obstructions to the enemy's vessels, and obviating the necessity for the use of as many sunken vessels as would otherwise be required; but being capable of easy removal, when no enemy is near, for the entrance and exit of those vessels, the arrival and departure of which it is desired to permit. R. H. Jewett, whose post-office address is Ripley, Brown Co., Ill., is the inventor of this harbor defense.

Hat.—This invention consists in a hat having the body and brim composed of linen, cotton, silk, woolen, or other cloth or woven material, without any stiffening or frame with the exception of one or more steel hoops or springs, which are inserted into hems or tucks formed in the brim for their reception by sewing or other means for the purpose of keeping th-

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brim in shape, and yet preserving its flexibility; such a hat being light, cheap and capable of being folded up in such manner that it may be carried in an ordinary pocket without inconvenience. W. H. Mallory, of Watertown, Conn., is the inventor of this improvement.

Submarine Gun.—The object of this invention is to construct a gun which is placed in the bow or any other part of the vessel, below the water-line, and which is so constructed that the same on touching a hostile vessel discharges its contents and pierces said hostile vessel below the water-line, and below those parts usually protected by iron armor. The invention consists in the arrangement of a gun projecting from the bow or any other part of a vessel, below the water-line, in combination with a hammer and trigger or their equivalent in such a manner that when the muzzle of the gun comes in contact with a hostile vessel its charge is exploded and said hostile vessel pierced below the water-line, and below those parts which generally are protected by iron armor. The invention consists further in the arrangement of a screw cap and packing rings, in combination with the muzzle of the gun in such a manner that the water is effectually excluded from the barrel of the gun, and at the same time the egress of the ball or shell from the muzzle is not materially impeded. The invention consists further in the arrangement of a hinged and of a rising and falling sliding valve in combination with the stuffing box, through which the gun passes in such a manner that when the gun recoils on being discharged said valves drop down immediately in front of the gun, and prevents the water following after the gun into the interior of the vessel. The invention consists finally in the employment for the purpose of introducing the charge, of a tube fitting into the breech end of the bore of the gun, and provided with a plunger acted upon by a saw, and provided with a stop to arrest it in the proper position in combination with a rising and falling wedge or check block in such a manner that the charge can be forced in from behind and deposited at the proper spot of the barrel, and the barrel can be firmly closed by the check block ready for firing. Joseph Duffy, of Paterson, N. J., is the inventor of this improvement.

Evaporating Kettle.—The object of this invention is the economical use of coal as fuel for heating a long train or block of kettles, such as is employed in the manufacture of salt, and the uniform heating of all the kettles in the block or train. The fuel now commonly used in this country for the evaporation of brine in kettles is wood, the fire being under the first one or two kettles in a block, and the others being heated by the flame and gaseous products of combustion; and as a block sometimes consists of as many as a hundred kettles arranged in pairs, while the heat under the first two or three pairs is so intense as to burn the salt on the bottoms; that under the last is so low that a fortnight is required to complete the evaporation, though it is completed in a few hours in the first pair. Owing to the high price of wood, attempts have been made to use coal for heating the kettles, but have not succeeded. To enable coal to be used it has been proposed to substitute long pans for kettles, but the first cost of substituting such pans for kettles has prevented its adoption. This invention consists in a certain novel system or arrangement of grated fire places, bridges, partitions and flues or passages for the economical use of coal under kettles, an important advantage of which is that it can be applied at comparatively small expense to blocks of kettles which have been already put up and used with wood as fuel. W. S. Worthington, of Newtown, N. Y., is the inventor of this improvement.

Tobacco Pipe.—The object of this invention is to preserve the tobacco in the bowl perfectly dry, and to prevent the moisture, which may pass through the stem, from coming in contact with the tobacco, so that the same burns just as well and tastes equally sweet at the bottom of the bowl as on the top. This object is attained by a very simple and ingenious arrangement of a cavity on the side of, or under, the smoke passage leading from the bowl to the tube or stem, in such a manner that the spittle or moisture, running down through the tube, will collect in said cavity, and not be allowed to find its way into the smoke passage or bowl, and thereby prevented from being drawn back into the mouth. Henry Kurth, of East New York, L. I., is the inventor of this improvement.

Grinding Mills.—It is well known to every one who has experience in milling, that a run of stones requires the almost constant attention of the miller to prevent them from grinding either too fine or too coarse. The reason of this variation in the grinding lies in the fact that, the spindle being heavily laden, and at times moving with considerable velocity, becomes heated by the friction of the followers (which are necessarily set snugly against the spindle to keep it from trembling) and expands and throws the runner a greater distance from the bed stone, and consequently, they don't grind as fine as before. Then, again, if the supply of grain is stopped for awhile, the labor of the spindle being reduced, the tendency of it is to cool and contract; and, consequently, to bring the stones nearer together, so that when the grain is again supplied to them they will grind too fine. To compensate for this variation no provision is made except that of adjusting the runner higher or lower, by hand, according as the stones are grinding too fine or too coarse. This adjustment can only be made by the miller, because only a practised eye and touch can discover the variation in the grinding and know just how much adjustment is required to correct it. The object of this invention is to prevent this variation in the grinding consequent upon the expansion and contraction of the spindle from the cause above-mentioned, and to this end it consists in having a number of longitudinal openings or apertures provided in the upper bearing of the spindle in combination with a fan which is secured to the spindle, and revolves within a suitable case below the bed stone, whereby a current of air is forced through the longitudinal apertures of the bearing of the spindle, and thereby both bearing and spindle are prevented from heating, and consequently from expanding, so that when the mill is once set to grind to a certain degree of fineness or coarseness, it will so continue to grind without any perceptible variation, so long as the grinding surfaces of the stones are in good working condition. The invention also consists in a facile mode of setting the followers up to and around the spindle. Cornelius Bollinger, of Harrisburgh, Pa., is the inventor of this improvement.

Sawing Machine.—This invention relates to a new and improved machine for sawing direct from the log, strips for the manufacture of hoe, fork and broom handles, and other similar articles. The invention consists in the employment or use of a vertical and a horizontal saw in connection with a feed carriage in which the log is suspended, the carriage being arranged in a novel way, and the log suspended within it in such a manner that it may be adjusted relatively with the saws, so that the latter may act properly on the log to effect the desired end.

Clothes-washing and Wringing Machine.—This invention consists in the employment of a suds-box provided with rounded ends, and having its bottom and ends covered by a series of rollers; the above parts being used in connection with a rubber which is also provided with rounded ends and rollers and a perforated top, all arranged in such a manner as to operate very efficiently. The invention further consists in the application to the suds-box of a wringer, arranged in such a manner as to be capable of being operated by a treadle, in order to subject the clothes to the requisite degree of pressure. Isaac W. Bowers, of Ovid Center, Mich., is the inventor of the above two patents, which bear date Aug. 25, 1863.

LENGTHENING THE CANAL LOCKS.—The engineers on the Erie Canal are making a survey for the proposed extension of the locks. The surveys and estimates are for locks two hundred and twenty-five feet long between the gates, and wide enough to pass boats twenty-six feet wide—the estimate to be presented to the legislature on the first day of its next session. It is supposed that locks of these dimensions will enable boats of five hundred tons burden to navigate the canals, and also pass iron-clad gunboats into the lakes if required. Some idea of the size of these new structures may be obtained when it is remembered that the present locks are only one hundred and ten feet long between the gates, and seventeen feet four inches in the bottom.

ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING SEPTEMBER 8, 1863.

Reported Officially for the Scientific American.

*** Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

39,787.—Mode of Removing Obstacles under Water.—Thomas K. Anderson, Hornellsville, N. Y. Ante-dated Oct. 26, 1862:

I claim the application of a cannon or mortar, constructed in such a manner that it may be suspended, and the muzzle brought to bear upon an object, at any angle, or in any position, under water, in the manner described and for the purpose herein specified.

39,788.—Construction of War Vessels.—Peter Andrew, Cincinnati, Ohio:

I claim, first, Constructing the gun deck of oblique plank in combination with the gun battery to be used thereon substantially as and for the purpose set forth.

Second, I claim constructing portholes with projecting sides substantially as and for the purpose described.

Third, I also claim the combination of beam, c, with the deck plank, when the same are locked together and braced substantially in the manner and for the purpose set forth herein.

Fourth, I claim the lock pieces, g g, in combination with the rampart, or the beak of the vessel, substantially in the manner and for the purpose set forth.

39,789.—Self-cleaning Chuck.—Jno. W. Bartlett, of Harmar and A. Morris, of Marietta, Ohio:

We claim the fans, D D D, openings, c c c, or their equivalent in combination with the chuck, a, in the manner and for the purposes set forth.

39,790.—Scroll Saw.—Abram Beekman, New York City:

I claim the oscillating beam or frame, C, in combination with the rockers, D G, saw, J, attached thereto, as shown, and the bars, E H, the latter being connected to the rockers and to the fixtures, F I, and all arranged substantially as and for the purpose herein set forth.

39,791.—Car Spring.—J. D. Billings and F. L. Tyler Rutland, Vt.:

We claim the torsion springs, C, in connection with the arms or levers, D, and block, E, arranged to operate in the manner as and for the purpose herein set forth.

39,792.—Mode of Cleaning Chimneys.—C. D. Blinn, Port Huron, Mich.:

I claim a cleaner for lamp-chimneys composed of two rods, A A, connected by a fulcrum pin, a, and provided at one end with cotton or woolen twist or other fibrous material substantially as set forth.

[This invention consists in the employment or use of two bars or rods connected by a fulcrum pin, and having a suitable fibrous material attached to one end, the parts being so arranged as to form a very convenient and efficient device for the purpose of cleaning lamp chimneys.]

39,793.—Grinding Mill.—Cornelius Bollinger, Harrisburgh, Pa.:

I claim, first, The fan, E, attached to the spindle, D, and revolving within the casing, F, in combination with the longitudinal apertures, e, in the upper bearings, f, of the spindle, when the former is used to force a current or currents of air through the apertures, e, of the bearing, in the manner and for the purpose substantially as described.

Second, The keys, c, terminating at the bottom in rounded screw threaded shanks, d, having nuts, g, fitted upon them, in combination with the lugs, b, and followers, c, when arranged to operate in the manner specified.

39,794.—Temperature Alarm.—Robert Boyle, Detroit, Mich. Ante-dated Aug. 19, 1863:

I claim the combination of the gate, G, graduated arc, E, and electric alarm, H, with the index, D, float, C, and mercury tube, B, in the manner herein shown and described.

[This invention consists in the arrangement of an oscillating index operated upon by a float projecting from a tube partially filled with mercury or other suitable liquid, and operating between a gate or two stops that are adjustable upon a graduated arc, in combination with an electro-magnetic hammer operating upon a suitable alarm bell in such a manner that when the temperature in the room or [space where the apparatus] is put up, [rises above or sinks below a certain point, the oscillating index by the expansion or contraction of its mercury in the tube and consequent] rising or falling of the float, is brought in contact with either of the stops on the graduated arc, and thereby the circuit of the electro-magnetic alarm is closed, and the hammer is caused to sound the alarm bell.]

39,795.—Faucet.—John Broughton, Chicago, Ill.:

I claim the arrangement of the cylindrical barrel, F, working in the interior of the shell, C, in combination with elastic washers, b c, screw cap, D, and handle, G, or its equivalent, all constructed and operating in the manner and for the purpose substantially as herein shown and described.

[This invention relates to certain improvements in the manufacture of cocks, faucets, &c., whereby all the parts can be readily finished on the turning lathe, no grinding of the plug or any other part is required, and an article is produced which is not liable to wear perceptibly, and which will remain tight for any length of time.]

39,796.—Door Bell.—N. F. Cone, La Crosse, Wis.:

I claim, first, The frog, G, in combination with the arms of the hammers, D D', and with the cam, E, constructed and operating in the manner and for the purpose substantially as herein shown and described.

Second, The ribs h h' in combination with the springs, d d', and arms, b b', of the hammers, D D', constructed and operating in the manner and for the purpose set forth.

[This invention relates to an improvement of that class of door bells in which a striking mechanism is brought in such relation to a stationary bell, that by rotating a crank or knob in either direction a hammer will be actuated and the bell struck.

39,797.—Mode of Keeping Sweet Potatoes.—William and James Davis, Richland, Iowa:

We claim packing or filling the interstices between and around the potatoes with calcined or burnt sand, and excluding air or moisture from the potatoes by the means and in the manner above substantially described.

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39,798.—Automatic Gate.—Levi S. Denning, of Newington, Mass. Ante-dated April 18, 1863 :

I claim in combination the gates, c, with the angle hinges figure 2, double latch, figure 3, side latches, q, axles, j, boxes, l, connections, m, weights, n, arranged and operating without ground frame work substantially as described.

39,799.—Governor for Steam Engines.—Frank Douglas, Norwich, Conn.:

I claim, first, The screw-arbor, g, movable clutch collars, K and M, and clutch block, i, when used in combination with the box, O, and bevel gears, N P and R, the whole combined to operate as described, so that the clutch collars, K and M, may be caused to run up and down out of clutch, and allow the clutch block, i, to remain at any point indicated by the regulator balls.

Second, The guide socket, f, when used to form a guide for the spindle, F, and screw-arbor, g, as described.

Third, The manner of suspending the link, V, as herein specified.

39,800.—Skate Fastening.—Frank Douglas, Norwich, Conn.:

I claim, first, The flange washer, B, with projections, c c, to receive a flat or dovetail head or screw, D, when firmly attached to a skate runner, as herein described.

Second, The screw, D, with a flat or dovetail head, when used in combination with the flange washer, B, and nut, F, for the purpose herein specified.

39,801.—Submarine Ordnance.—Joseph Duffy, Paterson, N. J.:

I claim, first, The arrangement of a sliding gun, A, projecting from the bow or side of a vessel, C, below the water line, in combination with a hammer, g, and nose, s, or their equivalents, constructed and operating in the manner and for the purpose substantially as herein shown and described.

Second, Having the stuffing box, D, provided at front and rear with valves, f g, constructed and operating with the gun, A, in the manner herein shown and described.

Third, The charge introducer, E, composed of a tube, h, and a screw-plunger, j, made and operating in the manner herein shown and described.

39,802.—Army Cooking Stove.—Horace L. Duncklee, Boston, Mass.:

I claim the combination of a sheet-iron cylindrical or equivalently-shaped body, A, strengthened and stiffened by a band or hoop, a, riveted or otherwise secured to the bottom thereof with a cast-iron top, B, provided with a flange, b, projecting downward, and fitting into the top of said cylindrical body so as to form the sole connection between the body and top, substantially as and for the purpose herein set forth.

39,803.—Device for Stopping the Shuttle in Power Looms.—David S. Esten, Hinsdale, Mass.:

I claim the spring, b, applied to act upon the picker staff through the medium of the two toothed cylinders, E F, strap, e, and hooked rod, g, the whole applied and arranged to operate substantially as and for the purpose herein specified.

[This invention consists in an improved mode of applying a spring to operate upon the picker staff, for the purpose of checking or stopping the shuttle in the shuttle box, whereby the use of a lighter binder spring, and the necessity of producing the usual amount of friction upon the shuttle as it enters the box, is obviated.]

39,804.—Harvester.—Franklin Ewer, Mendon Center, N. Y. Ante-dated Jan. 3, 1863 :

I claim connecting the finger-beam with the frame by means of the oblique coupling and brace bars, E G and F, jointed both to the said finger beam and frame, thereby allowing a free movement of the former, and at the same time so connected together and braced as to resist any strain; the whole arranged, combined and operating substantially as herein set forth.

In combination with the frame and finger-beam, I also claim the chain, L, or its equivalent, the crank, g, rod, p, and pendulum weight, N, arranged substantially as and for the purpose specified.

I also claim the cutter bars, P P, rasped, roughened, or provided with points on their outer surfaces, and having secured between them the knives, i i i, the latter projecting in the rear thereof, as well as in front, and forming the guide in the guard fingers, while the cutter bars slide free from contact, and clear the fingers from choking, substantially as herein set forth.

39,805.—Mode of raising Sunken Vessels.—William K. Fairbank, Broad Creek Neck, Md.:

I claim the combination of the screws, jacks and chains, or their equivalents, when used in connection with a pair of floats or buoys of similar size, form and construction, the chains passing down through tubes centrally situated along the length of each buoy or float, when each of the tubes is so formed with one curved or oblique side as to prevent the chains from binding in the tubes when the sunken object to which the chains are applied approaches towards the surface, thus continuing the strain or pressure centrally on the decks of the buoys or floats, and nearly in a vertical direction, from the commencement of the lifting until the object is raised to the surface of the water substantially as represented and described in the accompanying drawings and specifications.

39,806.—Rotating Harrow.—S. M. Garver, Monticello, Ill.:

I claim the relative arrangement of a harrow, a, suspenders, e, adjustable lever, f, and adjustable hand lever, k, in the manner and for the purposes set forth.

[The object of this invention is a rotary harrow suspended from a wheeled frame, and adjustable in position and in the depth of its penetration.]

39,807.—Paddle Wheel.—Rollin Germain, Buffalo, N. Y. Ante-dated June 30, 1863 :

I claim supporting and operating the paddle upon a shaft, I, whether said shaft is stationary or revolving, so that the paddle may be left free, to be moved outwardly towards the periphery of the wheel and edgewise to its line of motion, by centrifugal force, or to be moved transversely to the rim of the wheel by the action of the water, as the wheel revolves, substantially as described.

I claim the circular inclined planes, K, double or single, for the purposes and substantially as described.

I claim the circular inclined planes, K, in combination with the paddle, for the purposes and substantially as herein set forth. I claim the friction rollers, l, in combination with the paddle for the purposes and substantially as herein set forth.

I claim holding the paddle stationary in a position parallel with the direction of the vessel when desired, by means of the hook, M, chain, M′, or by other means, substantially the same, for the purposes set forth.

I claim so hanging the paddle upon its shaft, that an outward movement will be communicated to the paddle by centrifugal power, and an inward movement by the action of the water thereon, for the purposes and substantially as set forth.

39,808.—Butter Worker.—C. L. Gilpatrick, Lewiston, Maine :

I claim the combination of the worker, C, and box, f, with the box, A, provided with the zinc lining and water chamber, F, all constructed and arranged in the manner and for the purpose set forth.

39,809.—Umbrella.—Gideon Hamilton, New York City. Ante-dated Dec. 18, 1861 :

I claim first, An umbrella furnished with a receptacle for water draining therefrom as described.

Second, The combination and arrangement of the receptacle, A, leader, B, concave top, C, with its holes, and the ring, D, as and for the purposes described.

39,810.—Sirup Evaporator.—Lyman P. Harris, Mansfield Ohio :

I claim, first, The construction of sirup and sugar evaporators, substantially as and for the purposes described.

Second, The combination of a corrugated and a plane surface in the one pan bottom, substantially as described.

39,811.—Grates for Stoves.—Luther W. Harwood, Troy, N. Y.:

I claim, first, Two sub-grates, B C, mounted side by side on shanks which are fast on the sub-grates, and so shaped and arranged together in sockets or bearings, that the said sub-grates can be reciprocated along each other on their respective shanks, and also rocked or tilted together like one grate on the said combined shanks, as an axis common to both sub-grates, substantially as herein set forth.

Second, I also claim in combination with two reciprocating and rocking sub-grates, mounted together on divided ournals common to both sub-grates, substantially as herein described, a supporting arm or arms, G, arranged on the under side of and carried by the said combined sub-grates, substantially as herein set forth.

Third, I also claim the combination of a pair of levers, H H, two sets of followers or drivers, f f f f, and two connecting rods, K K, with two sliding and turning sub-grates, B C, mounted together on divided journals, common to both of the said sub-grates, substantially as herein set forth.

Fourth, I also claim in combination with two sliding and turning sub-grates, B C, mounted together on divided journals common to both sub-grates, and provided with drivers or followers, f f f f, substantially as herein described, the inclined guides, m n, arranged on the under side of and carried by the said combined sub-grates and followers, substantially as herein set forth.

39,812.—Hydrant.—Napoleon Hayman, New York City :

I claim the slide, B, fitted within the box, A, and provided with the opening, a, and recess, b, in combination with the service or discharge-pipe, D, supply-pipe, E, and waste-pipe, F, arranged respectively in relation with the opening, a, and recess, b, in the slide, B, to operate as and for the purpose herein set forth.

[The object of this invention is to obtain a hydrant which will admit of the waste water escaping from the service or discharge pipe in a more rapid manner than hitherto, after the flow of the water from said pipe is stopped, so as to prevent the possibility of the freezing up of the hydrant in severe weather in winter.]

39,813.—Clothes-wringer.—Reuben G. Holmes, Worcester, Mass. Ante-dated Jan. 21, 1863 :

I claim the combination of the two springs as shown by H I, as fully set forth in this specification.

39,814.—Clothes-wringing Machine.—Reuben G. Holmes, Worcester, Mass. Ante-dated April 20, 1863 :

I claim the arrangement of the springs, K and L, so arranged as to bear upon the center of the bar, I, thereby producing a greater and more equal pressure.

39,815.—Pegging Awl-holder and Extractor.—Hugh Huston, Cannonsburgh, Pa.:

I claim, first, The awl extractor, c, its extensions, c1 c2, its pin, h, and its mode of fastening, K K1 K2, as and for the purposes specified.

Second, The flange, j3, as and for the purposes specified.

Third, The ferule with its slot, i, and pin hole, K2, as and for purposes specified.

Fourth, The awl-holder, f f1 f2, the awl, g, the spiral spring, d, in combination as and for purposes specified.

39,816.—Means for defending Harbors and River Channels.—R. H. Jewett, Mount Sterling, Ill. Ante-dated April 29, 1863 :

I claim, first, The employment as a harbor defense of one or more vessels, A, each having ports, b b, a hatch, c, fitted with pipes, d e, and a superstructure, B, the whole combined substantially as herein specified.

Second, The employment in combination with the above described vessel or vessels of floats, C C, applied and secured substantially as herein specified.

39,817.—Lathe for turning Billiard Balls.—L. A. Johnson, San Francisco, Cal. :

I claim, first, The rotating center formed of the rod, I, provided with a collar, b, and fitted in a socket, H, on the arbor, E, and also provided with a socket or cap, d, to receive a piece of india-rubber, e, or other suitable yielding material, in combination with the concave chuck, G, attached to the mandrel, C, all arranged substantially as and for the purpose specified.

Second, The tool rest, composed of the adjustable plate, l, turning plate, p, and slide, u, all arranged to operate in connection with the chuck and rotary center, for the purpose set forth.

[This invention consists in the employment or use of an adjustable tool rest in connection with a concave chuck and a revolving center, all arranged in such a manner that billiard balls and other spherical articles may be turned very expeditiously and in a perfect manner.]

39,818.—Dry Dock.—Casper Krogh, Kroghville. Wis. :

I claim, first, The combination and arrangement of the air-distributor, C, the flexible pipes, c c, the tubes, d d, with the air-tight chambers or compartments, D B, constructed and operating substantially as and for purposes herein delineated and set forth.

Second, I claim the combination and arrangement of the stationary uprights, D D, the tubes, d and e, and scale board, s, substantially as and for the purposes specified.

Third, I claim the combination of the hinged standards or uprights, D D, the hinged valve rods, m m′, the jointed tubes, d and e, arranged and operating substantially as and for the purposes described and shown in figure 2.

Fourth, I claim constructing said lifters or docks, B B, with the partitions and providing them with the outlets, valves, and valve rods, and tubes, d and e, substantially as described.

39,819.—Tobacco-smoking Pipe.—Henry Kurth, East New York, N. Y. :

I claim a smoking pipe which has its shank, B, made with a smoke passage, a, and a moisture cavity, b, arranged in respect to each other and to the bowl and stem, C, in the manner herein shown and described.

39,820.—Gas-burner.—Frederick Lumkenheimer, Cincinnati, Ohio :

I claim the conical adjustable valve, g g figure 2, in combination with the caps or hood, C, with the screw, i, the openings, F F F, the tubes, H H and G G, for the purpose of regulating the flow of the gas, substantially as set forth and described.

39,821.—Water Indicator for Steam Boilers.—George Lutz, Lancaster, Ohio :

I claim the combination and arrangement of the pinion, ratchet, rock shaft and float, substantially as set forth, for the purpose specified.

39,822.—Hat.—W. H. Mallory, Watertown, Conn. :

I claim a hat constructed of flexible material, with a brim extended and held in shape by means of covered flat steel springs, applied in perpendicular positions, all as herein described and for the purposes specified.

39,823.—Metallic Cartridge.—Edward Maynard, Washington, D. C. :

I claim combining any suitable detonating compound, with a metallic or otherwise solid and durable cartridge by means of an arm, cord or thong, substantially in the manner and for the purpose herein set forth.

39,824.—Machine for Handling Hides.—B. B. Mereness, Georgetown, N. Y. :

I claim, first, The combination of the outer perforated cylinder, with the perforated paddles of the inner cylinder, substantially as described.

Second, I claim giving the surface or edge of the paddles, alternately, a convex and a concave surface, substantially as set forth.

Third, I also claim arranging the paddles relatively to each other, substantially as described, that is to say, one diverging from the head in one direction, and one or more diverging from the head in any opposite direction, as set forth.

39,825.—Self-cocking Revolving Fire-arm.—R. S. Mershon, Philadelphia, Pa., and Jehu Hollingsworth, Zanesville, Ohio :

We claim the application of a reservoir of power to a repeating fire-arm, as described herein, for the purpose of cocking the hammer and by liberating it, rotating and locking the chambered cylinder simultaneously for one or more discharges, without using the hand to cock the arm as in the ordinary way.

Second, We claim so combining the reservoir of power with the hammer and its independent spring, as herein described, that the action of the reservoir of power can be instantly suspended and the hammer cocked, chambered cylinder liberated, rotated and locked, by hand, as in ordinary hand-cocking revolving fire-arms.

Third, We claim the axis, shaft or spindle, on which is placed the arbor for the coiled spring, the escape wheel, the hammer, the stop-work and the winding disk, as herein described, in combination with the reservoir of power or coiled spring, acting as a spindle or bearer for each piece.

Fourth, We claim the combinations of the reservoir of power with an arbor, escape wheel, hammer, hammer dog, hammer finger, chamberlock, chambered cylinder and trigger, as herein described, so that when the reservoir of power is wound up, by pulling the trigger the hammer will be liberated and the arm discharged, and then by simply letting go the trigger, the hammer will be instantly cocked, chambered cylinder liberated, rotated and locked, ready for another discharge.

Fifth, We claim the combination of the reservoir of power with the stop-work, as herein described, for the purpose of limiting the power and action of the reservoir of power.

Sixth, We claim the combination of the reservoir of power with the winding disk, as herein described, for the purpose of accumulating power, by winding up said reservoir of power.

Seventh, We claim the combination of the reservoir of power with the winding disk and bolt, substantially as described, for the purpose of suspending the action of the reservoir of power, so that the arm can be operated by hand.

Eighth, We claim the combination of the trigger and its two arms or forks, with the escape wheel, and also with the hammer dog, as herein described, so that when the trigger is pulled, one of the arms will liberate the hammer dog, and hammer, and permit the arm to be discharged; and at the same time its other arm will be entering into a scape-wheel tooth or notch, thus holding at rest the scape-wheel and reservoir of power; the arm or fork which has been holding the scape-wheel and reservoir of power at rest, being withdrawn by releasing or letting go the trigger, the reservoir of power and scape-wheel will become free to act, and will, by means of the hammer dog, rotate and cock the hammer, and by it, liberate, turn and lock the chambered cylinder in its place, ready for another discharge.

Ninth, We claim the application of the self-cocking mechanism herein described, to all chambered cylinders in which metallic cartridges are used.

39,826.—Flour Bolt.—Richard Mohler and John Becker, Lancaster Co., Pa. :

We claim the arrangement of a series of levers or beaters, F, made adjustable separately or collectively by means of the holes, h, pins, G, rail, D, and end supports, E, operating substantially in the manner specified against the under surface of the reel, as shown.

39,827.—Churn Power.—J. D. Parrot, Morristown, N. J. :

I claim the arrangement of two or more springs, C C′, on the same shaft, B, in combination with the cog-wheels, D D′, and pins, a a′, and with the adjustable pinions, G G′, on the shaft, E, constructed and operating in the manner and for the purpose substantially as shown and described.

[The object of this invention is to combine two or more springs with a series of pinions and cog-wheels, and with a crank shaft, in such a manner that either one or more springs can be wound up and made to impart a rotary motion to said crank shaft, and that by the action of the crank on said shaft, the dasher of a churn or any other small machine can be operated with any desired power, as long as may be required to accomplish a certain amount of work.]

39,828.—Process of Recovering Wool from Mixed Fabrics.—J. G. Perzel, New York City. Ante-dated April 3, 1863 :

I claim the solution of chloride of zinc or analogous chlorides, either alone or with the aid of diluted sulphuric acid, in a manner as described and for the purpose set forth.

39,829.—Rotary Engine.—James Platt, New York City. Ante-dated March 14, 1862 :

I claim, first, The shell, I, provided with the pistons or valves, J J′, attached to the shaft, F, and encompassing the stationary head, C, which is provided with the abutment, D, and communicates with the induction and eduction passages, e f, of tube, B, substantially as and for the purpose set forth.

Second, In combination with the stationary tube, B, head, C, and rotary shell, I, the stationary shell, A, the latter encompassing the shell, I, and head, C, and arranged as shown.

Third, The operating or turning of the valves, J J′, by means of the arms, K, and guide or groove, M, arranged as shown, when said means are used in connection with the head, C, and shell, I, and all combined and arranged for joint operation, as set forth.

[This invention relates to a new and improved arrangement of parts whereby it is believed that the chief difficulty hitherto attending the operation of rotary engines, is obviated; namely, the unequal expansion of the parts, which produces leakage and consequent wear and tear, and a general derangement of the mechanism, which is soon rendered inefficient.]

39,830.—Bearing for Vertical Shafting.—James Platt, Utica, N. Y. Ante-dated Oct. 25, 1862 :

I claim the friction rollers, F, fitted in an annular revolving frame, E, in combination with the adjustable box, C, placed on the framing, A, and the collar, G, placed on the shaft, B, all arranged as and for the purpose herein set forth.

[This invention consists in the employment of a series of conical rollers placed in an annular frame, which is fitted loosely in an adjustable box placed in or on the framing designed to support the shaft, in combination with a collar placed on the shaft and provided with a beveled under surface, which rests or bears on the conical rollers, all being arranged in such a manner as to properly support the shaft and admit of its being rotated with but a comparatively small amount of friction.]

39,831.—Water Wheel.—James Platt, Utica, N. Y. Ante-dated April 2, 1863 :

I claim the buckets, D D, of curved form attached to frames, I I, which are connected by joints or hinges, d d, to the plate, B, in combination with the case, E, and the curved inclined plane, K, all arranged for joint operation, as and for the purpose herein set forth.

I further claim the combination and arrangement of the buckets, D D, frames, I I, plate, B, case, E, curved inclined planes, K, pressure plate, M, attached to the semi-circular plate, L, and spring, N, for the purpose herein specified.

[This invention relates to an improved horizontal water wheel of that class in which sliding buckets are employed, and consists in constructing and arranging the buckets in such a manner that they will yield or give, in case of any foreign substances, such as drift-wood, &c., entering the case of the wheel, and prevent the latter being injured thereby.]

39,832.—Water Wheel.—James Platt, Utica, N. Y. Ante-dated Oct. 17, 1862 :

I claim, first, The curved sliding buckets, E E, connected to shafts, D D, and arranged with springs substantially as shown to operate as and for the purpose specified.

Second, The combination of the cam, J, and abutment, G, when used in connection with the sliding or yielding buckets, E E, arranged as shown and described.

[This invention relates to an improved horizontal water wheel of the class which are fitted in a case provided with an abutment and which are provided with adjustable buckets. The invention consists in a peculiar arrangement of the buckets, and the means employed for operating the same, to enable them to pass the abutment and be brought in proper position to be acted upon by the water as the latter passes through the case.]

39,833.—Water Wheel.—James Platt, Utica, N. Y. Ante-dated Oct. 25, 1862 :

I claim, first, The employment or use of the drop buckets, H, attached to the shafts, G G, when used in connection with the annular water passage, d, in the case, A, provided with the abutment, B, substantially as and for the purpose specified.

Second, The manner of operating the drop buckets, H, as herein shown and described; to-wit, by means of the bent arms, I, fitted on the shafts, G G, of the buckets, provided with rollers, J, at one end; and the stationary cam, J, attached to the bottom, c, of the case, A, and the projections, K, attached to the under side of the top plate, F, of the case, A.

[This invention relates to an improvement in that class of horizontal water wheels which are provided with movable buckets so arranged as to present themselves at a proper time to the action of the water and receive its impacting force, and then move or adjust themselves so as to allow the water to escape freely from the case of the wheel.]

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39,834.—Water Wheel.—James Platt, Utica, N. Y. Ante-dated July 20, 1862:

I claim the arrangements of the pivoted buckets, H H, recesses, m m, and segment, G, with the wheel, C, hubs, 4 g, arms, f, and inclined sector chute, D, all in the manner herein shown and described.

[The object of this invention is to obtain a water-wheel which will receive and retain the water so long as it acts most efficiently upon it, and discharge the water at the moment when it ceases thus to act, thereby preventing the water serving as a "drag" or drawback to the wheel, a result which detracts greatly from the efficiency of the wheel and is the principal source of loss in power in horizontal water wheels, a class of wheels to which this invention more particularly refers.]

39,835.—Coal Breaking Roll.—William R. Reece, Tremont, Pa. Ante-dated Jan. 16, 1863:

I claim a coal breaking roll made in sections, B, when each section has recesses for the reception of the shanks of the teeth, G, and recesses for the reception of keys, e, for confining said teeth to the sections, and when the keys of one section are retained in their places by the adjacent section, the whole being arranged substantially as and for the purpose herein set forth.

39,836.—Fire Place.—David A. Ross, Cincinnati, Ohio:

I claim the rotating or movable back, B, in combination with the adjuster, E, when constructed and operating substantially as described.

39,837.—Cultivator.—G. H. Schanck, Libertyville, Ill. Ante-dated April 2, 1862:

I claim extending the hinged frame, g, back, and locating the drivers seat, s, thereon, in relation to the foot board, f, handle, m, and spring, n, as described: whereby the driver can drop the cultivator ploughs, with his hands, and at the same time press them into the ground, or regulate their dip with his weight.

39,838.—Truck for pulling Stone.—Gilbert L. Sheldon, Marlboro, Mass. Ante-dated July 26, 1863:

I claim the combination of the single bar, H, of the frame, K K K K K K, and single pulley, A, with its accompanying shaft and ratchet, a', substantially in the manner and for the purposes described.

Second, I claim the use of the chain, B, in combination with the single pulley, A, when said chain is attached on each side of the said pulley, substantially as represented and for the purpose described.

39,839.—Last Holder.—George H. Smith, Lowell, Mass.:

I claim, first, The sliding bolt, E, in connection with the perforated bar, D, arranged substantially as shown for holding the last at a greater or less degree of inclination as may be required.

Second, The levers, N P, link, O, screw-link, Q, and nut, R, all arranged substantially as shown for the purpose of securing the last in proper position as set forth.

[This invention relates to a new and improved device for holding lasts designed for the use of shoemakers. The object of the invention is to obtain a device for the purpose specified which will, by a simple adjustment, hold the last securely in position, and at the same time admit of the latter being inclined at any desired angle and turned or revolved as required while being thus inclined.]

39,840.—Army Stretcher.—Jacob J. Smith, Philadelphia, Pa.:

I claim the employment of the knee jointed bars or plates, C C, so that they shall operate in combination with the side rails, A A, and canvas, B, of a stretcher, substantially in the manner described and set forth, for the purpose specified.

I also claim in combination with the said knee-jointed bars or plates, C C, the employment of the pawls, D D, and ratchet teeth, E E, substantially in the manner described and set forth, for the purposes specified.

38,841.—Hollow Auger.—George N. Stearns, Syracuse, N. Y. Ante-dated Jan. 16, 1863:

I claim, first, The construction of the body of the auger substantially as described, and combining therewith the adjustable thimble, C, the adjustable cutter, B, and the adjustable shank, a, for the purposes substantially as specified.

Second, I also claim confining the cutter within the mortise and sustaining and locating it so as to obtain the longitudinal, vertical, and lateral adjustment and the drawing cut, substantially as and for the purposes described.

39,842.—Pump.—Nathan Stedman, Aurora, Ind.:

I claim the hollow piston, B, provided with the hollow valve, H, and tubular rod, C, in combination with the water passages, D E F, and double puppet valve, G, all arranged to operate as and for the purpose herein set forth.

[This invention consists in the employment or use of a hollow piston provided with a valve of novel construction and a tubular piston rod; in connection with water passages and a double valve placed in relation with the pump cylinder, and all arranged so as to operate in the most efficient manner.]

39,843.—Bridle Bits.—C. E. Stockder, West Meriden, Conn.:

I claim as a new article of manufacture a bit ring, A, provided with a tongue, a, and eye, b, as and for the purpose specified.

[This invention consists in the arrangement of an eye and tongue in the bit ring in such a manner that the end of the rein can be fastened directly in the bit ring itself, thus avoiding the necessity of doubling up the strap and without the application of an extra buckle and martingale stop, whereby the manufacture of the rein is rendered much cheaper than that of ordinary reins, and furthermore by the use of my bit rings the reins are made of a uniform thickness throughout, and therefore not liable to crook and break.]

39,844.—Gas Check for Breech-loading Fire-arms.—John C. Symmes, U. S. Ordnance. Ante-dated Dec. 25, 1862:

I claim, first, Making the gas-choke of the form and using it in the manner substantially set forth.

Second, Making the gas-choke largely fire-proof, substantially as set forth.

39,845.—Stop Motion for Railway Drawing Heads.—Henry Tabor, Hopkinton, R. I. Ante-dated Aug. 23, 1863:

I claim, first, The employment in railway drawing heads of the plate, O, or its equivalent, standing between the rolls and so connected and arranged that a diminution in the size of the roving will allow the rolls to bite upon and move the same so as to stop the machine, substantially as herein set forth.

Second, Connecting both the bugle, P, and the plate, O, to the same liberating apparatus, L', and its connections in the manner and for the purpose herein set forth.

Third, The arrangement in stop motions for a railway drawing head, of the lever, N, and spring, K, so that the latter shall perform the double function of holding the lever, L, and turning the shaft, J, as herein set forth.

39,846.—Chimney Cap.—James Tomlinson, Racine, Wis.:

I claim the scooped shaped wings or funnels, C, in connection with the conical plates, B D, and tubes, A E, all arranged substantially as and for the purpose herein set forth.

[This invention consists in providing the smoke jack or ventilator with a series of scoop-shaped wings, arranged around the upper end of the smoke or ventilating tube and between two conical plates, whereby all air that enters the smoke-jack or ventilator laterally has a spiral motion communicated to it, which increases the draught and renders the device very efficient and perfect in its operation.]

39,847.—Last Machine.—J. W. Town, South Woodbury Vt.:

I claim the employment or use of different sizes of guides in a last machine, so that with the same pattern and set of knives lasts of different size can be turned and the proportion maintained perfectly.

Also the arrangement of guides, a, of different size on the periphery of a wheel, A, substantially as and for the purpose set forth.

This invention relates to an improvement in the guide or model wheel of a last machine, arranging the same in such a manner that without changing the cutters or pattern, different sizes of lasts can be produced.]

39,848.—Composition for Polishing Brass.—William H. Trissler, Cleveland, Ohio:

I claim the combination of burnt clay, tartaric acid and common salt, substantially in the manner and for the purposes herein set forth.

39,849.—Artizan's Stage.—Windsor B. Wait, South Reading, Mass.:

I claim the stage or chair, A, as not only made with the platform, a, arranged as described, but with the auxiliary platform or seat, c, placed above the platform, a, and hinged to the body of the frame so as to be capable of being operated as specified.

I also claim the stage, A, as made with the end boxes or receptacles, d d, arranged relatively to its arms and hinged seat as specified.

And in combination with the stage, A, I claim the windlasses, B B, their operative mechanisms and tackles constructed to operate substantially as described.

And in combination with the stage, its windlasses and tackles, I claim an adjustable balancing mechanism, arranged and constructed so as to operate substantially as described.

And in combination with the stage, its windlasses, their operative mechanisms and tackles, I claim the adjustable bars, E E, provided with wheels and handles arranged with respect to them as specified.

39,850.—Double-barrelled Revolving Fire-arm.—H. D. Ward, Pittsfield, Mass.:

I claim, first, So applying two barrels in combination with one rotating cylinder having a single circle of chambers as to provide either for the discharge of two of the said chambers, one through each barrel, without rotating the cylinder between the discharges or for the discharge of the several chambers successively through one of the said barrels, substantially as herein described.

Second, Combining the two hammers with each other and with the dog, h, for rotating the cylinder by means of the sleeve, f, or its equivalent, having a projection, p, the arm, I, having a projection, q, the spring, r, and the pin or projection, S, the whole arranged to operate substantially as and for the purpose herein specified.

39,851.—Coffee Boiler.—Nathaniel Watermann, Boston, Mass.:

I claim the improved coffee decoction apparatus as made with the foraminous cone, H', or its equivalent, arranged and combined with the hot water receiver, D, the coffee holder, F, or the same and its spring expander, substantially as specified.

I also claim the arrangement and combination of the helical spring, the sliding latch or latches, and the catch or catches thereof, together and with the expander and water-vessel, the same being substantially as specified.

39,852.—Steam Pump.—William Watts, Newark, N. J.:

I claim, first, The combination of the projection or bearing, P, with the wedge, W, bolt, B, and cap, C, substantially in the manner and for the purposes described.

Second, I claim the combination of the said wedge, W, with the valve, V, substantially in the manner and for the purposes described.

39,853.—Closing Fruit Cans.—William Webster, Middletown, Ohio:

I claim the spring, A, formed of tempered wire in the manner described, and applied by one direct operation, substantially as and for the purpose set forth.

Also the loop-formed traverse bar or its equivalent, applied and used in the manner and for the purposes specified.

I also claim the combination of the traverse bar, C, and spring, A, as and for the purpose described.

39,854.—Crutch.—John D. W. Wemple, Albany, N. Y.:

I claim, first, The spiral springs, H H, fitted within the tubes, G G, and secured at their lower ends to the lower ends of said tubes in combination with the tubes, F F, in which the tubes, G, are fitted and allowed to slide freely, and to which the upper ends of the springs, H, are connected by screws, o, which pass through the tubes, F, and through longitudinal slots, m, in the tubes, G, substantially as and for the purpose herein set forth.

Second, Constructing the crutch joints, C, arranged as shown or in an equivalent way, to admit of the folding of the crutch when desired as herein described.

Third, The point or spur, D, inserted in the lower end of the crutch when used in combination with the sliding or adjustable tube, E, provided with a catch or fastening, substantially as and for the purpose specified.

[This invention has a three-fold object, to-wit, First to construct or provide the crutch with joints, so arranged as to admit of it being folded and rendered compact for convenient stowing away when not in use, as for instance, when the user or owner is seated in a vehicle. Second, to provide the crutch with a point or spur at its lower end, so arranged with certain parts, that the point or spur may be exposed when required for use, as for instance, in traveling over ice, and be covered or enclosed when not required for use, as for instance, when the crutch is used in the house and the point or spur would injure carpets or a good flooring. Third, in applying springs to the crutch in such a manner that the full benefit of their elasticity will be obtained at all points of their movement or tension, and the springs thereby rendered much more efficient than those previously used.]

39,855.—Sugar Evaporator.—Abraham Whitenack, North Salem, Ind.:

I claim the combination with the scraper or movable partition, I, of the evaporator pans, A B, and C, curved or bent tubes, D E, and gates, F and G, when the said parts are all constructed and arranged and operate in the manner and for the purposes herein specified.

[In this invention a movable partition or scraper is employed, having an elastic or yielding sole which adapts it to conform to any inequalities in the bottom of the pan, so that the entire body of juice may be moved from pan to pan without any escaping past the scraper.]

39,856.—Burner for Coal Oil Lamp.—Anna C. Wilhelm, Philadelphia, Pa. Ante-dated May 13, 1863:

I claim surrounding the wick-tube, B, with a tapering jacket, A, fitting closely around the upper orifice of the said tube, substantially in the manner described and set forth, for the purposes specified.

I also claim in combination with the said jacket, A, the two projecting guards, a2 a2, the same being constructed and arranged substantially as set forth, for the purposes specified.

39,857.—Elevating or Scaling Ladder.—Solomon D. Wollison, Pittsfield, Mass. Ante-dated Dec. 25, 1862:

I claim the manner of attaching the said ladder to the base board, A, and platform, I, and the manner of applying the power for operating the said elevator, that is to say I claim:—

First, Uniting one end of the top and bottom toggle to the base board, A, and flat form, I, in the manner described, so as to cause that end of all the toggles to raise and fall on a line drawn through the points so attached.

Second, The arrangement and combination of the wheel, L, with the lower end of the bottom toggle and the base board, A, as shown and described, to facilitate the rise and fall of the toggle.

Third, The arrangement of the lever, O, with the bottom toggle, the wheel, L, and the axle, Q, in the manner substantially as described and shown.

Fourth, The combination of the screws with the upper toggle joint and platform, I, in the manner shown and described, to enable a man to raise and lower himself as set forth.

Fifth, The block, D, in combination with the springs, c, and axle of the track wheel, in the manner described, for the purpose specified.

39,858.—Apparatus for throwing Projectiles.—Solomon D. Wollison, Pittsfield, Mass. Ante-dated Jan. 31, 1863:

I claim the combination of a torpedo, or similar projectile, with the elongating projector, for the purpose of projecting the same as described, for the purpose specified.

39,859.—Setting Evaporating Kettles.—William S. Worthington, Newtown, N. Y.:

I claim the arrangement of a series of fire grates, C1 C2 C3, bridges E E, partitions, F F, and intervening passages, I1 I2, in relation to each other and within the arch of a block or train of evaporating kettles, substantially as and for the purpose herein specified.

39,860.—Horoscopes.—Michael Eble (assignor to Rudolph Engler), Ellwangen, Kingdom of Wurtemburg:

I claim the arrangement of the oscillating, L-shaped index, A, in combination with the adjustable scale board, B, constructed and operating substantially as and for the purpose herein shown and described.

[This invention consists in the arrangement of an L-shaped index provided with plumb line and with a diopter and bracket to intercept the sun's rays, in combination with a T-shaped adjustable scale board, in such a manner that by the combined action of the scales on the scale board and of the L-shaped index, the position of which is governed by the position of the sun, the time of the day can be determined at any moment when the sun shines.]

39,861.—Anti-typhus Remedy.—J. P. Fortig (assignor to himself and J. C. Salzgeber), St. Louis, Mo.:

I claim the within-described composition of matter or remedy, compounded of the ingredients mentioned, in the quantities and proportions named, as a new article of manufacture and trade for the purposes set forth.

39,862.—Apparatus for cutting Cloth.—Barnett Hansell, John McCann & Samuel McCambridge, Philadelphia, Pa.:

We claim, first, The construction of the cylinder, B, with one or more cutter slots, g'', substantially as described, for the purpose of cutting the cloth into definite and suitable lengths and forms as above set forth.

Second, Combining and arranging the extension bar or bars, J', with the cylinder, B, for the purpose of varying the circumference of the latter, substantially as described and for the purpose set forth.

Third, Constructing the apron, F, with the slotted cutter bar, J, when combined and arranged with the cylinder, B, substantially in the manner and for the purpose above set forth.

Fourth, The combination of the knives, Q Q, with the cylinder, B, when arranged and operating substantially as described.

Fifth, The combination and arrangement of the reciprocating roller, U, with the cylinder, B, substantially as and for the purpose above set forth.

Sixth, The arrangement of the support bar, T, in relation to the knives, Q Q, and cloth, M, substantially as described.

39,863.—Sofa Bedstead.—T. J. Magee (assignor to himself and James H. Hoole), Cincinnati, Ohio:

I claim the arrangement of grooved trestles, B B', hinged vertically to the sofa back, and folding frame, F F', hinged horizontally to said back; in combination with studs, I I, grooves, D D', springs, K K', and catches, M M'; the whole being combined and operating substantially as set forth.

39,864.—Clothes-wringer.—Caleb H. Packard, North Bridgewater, Mass., assignor to John J. Haley, Curtis G. Morse & Addison Boyden, Boston, Mass.:

I claim in combination with a pair of squeezing rolls, one or both of which are hung in yielding bearings, and both driven by cogged gears, the intermediate gears, E and F, for the purpose of continuing to drive the squeezing rolls however much they may separate or approach each other, substantially as described.

39,865.—Water-proof Boots and Shoes.—Edwin L. Simpson, Bridgeport, Conn., assignor to himself and Jared Wilson Post, New Haven, Conn. Ante-dated Aug. 15, 1863:

I claim as a new article of manufacture boots and shoes, when the same are made from the water-proof material, substantially as in the manner herein set forth.

39,866.—Harvester Cutter Sharpener.—John K. Staman (assignor to himself, C. C. Staman & M. H. Mansfield), Mifflin, Ohio:

I claim the concave, acute-angled, reversible bars, A and B, arranged and operating as and for the purpose set forth.

39,867.—Lithographic Press.—John Taggart (assignor to himself and Stephen O. Thayer), Roxbury, Mass.:

I claim the improved lithographic press as made not only with the stationary bed, B, but with the scraper, D, supported by a movable carriage, E, and provided with mechanism substantially as described (or its equivalent), for operating the scraper or depressing it upon and relieving it from the tympan and stone, the whole being as and to operate as specified.

I also claim the said mechanism or combination for operating the scraper during the reciprocating rectilinear movements of its carriage, the same consisting not only of the channels, i, and their switches, g, and gates, t, constructed and arranged substantially as described, but of the arms, l, the depressors, h, and the elevating springs, m, arranged as set forth.

I also claim the combination of the spring latch, f', applied to the carriage, E, and the movable or spring dog, d' (applied to the tympan shaft), with the tympan shaft, the scraper and its carriage, the whole being as and for the purpose set forth.

39,868.—Machine for stretching and folding Mosquito Netting.—Jacob A. Van Riper & Lewis Van Riper, deceased (Jacob A. Van Riper administrator), Spring Valley, N. Y.:

I claim, first, The reciprocating platform, P, in connection with the reciprocating plates or feeders, K K, and rollers, L L, all arranged substantially as and for the purpose set forth.

Second, The combination of the oblique rollers, B, platform, P, plates, K, and rollers, G, all arranged for joint operation as and for the purpose specified.

[This invention consists in the employment or use of a series of oblique rollers arranged in pairs, and used in connection with feeders and a reciprocating bed; all being so arranged that the work of stretching and folding the netting or other material may be done in an expeditious and perfect manner.]

39,869.—Cartridge Case for Revolving Fire-arms.—John H. Vickers (assignor to himself and Lucius W. Pond), Worcester, Mass.:

I claim, first, The thimble or tube, C, constructed substantially as herein described, and applied substantially as herein set forth, in combination with a chamber bored large enough for the passage of the circumferentially projecting flanges of the cartridges from the front ends thereof, and closed or partly closed at their rear ends.

Second, The movable nipples, g g, applied in combination with the thimbles or tubes, C C, substantially as and for the purpose herein specified.

39,870.—Lasting Machine.—Truman Wolcott, Stowe, Mass., assignor to himself and George T. Wolcott, Marlboro, Mass.:

I claim, first, The heel, side and toe crimping bars, d d e e f f, with plates, j, attached, arranged as shown and operated by the ring, G, provided with eccentric slots, c, in which pins or friction rollers on the slides, F, are fitted; substantially as and for the purpose set forth.

Second, The hooks, g g, arranged as shown to operate in connection with the crimping bars as and for the purpose set forth.

Third, The elastic plates, i i, in connection with the hooks, h, to operate in connection with the crimping bars as and for the purpose specified.

Fourth, The loaded treadle, B, with rod, D, attached, in combination with the crimping bars, all arranged to operate substantially as and for the purpose specified.

[This invention relates to a new and improved machine for adjusting uppers on lasts, whereby the work may be done in a superior manner and very expeditiously.]

RE-ISSUES.

1,533:—Side Lights for Ships.—Enoch Hidden, New York City. Patented June 21, 1853:

I claim the arrangement of screws, F, tapped into the main frame, B, in combination with inclined planes or spirals, O, forming part of said screws that hold the light frame or cell containing the glass fast to the india-rubber in its grooved seat in the main frame, with its stop pin, n, for stopping the screw in its proper position, when the light is to be opened for ventilation.

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I also claim the projecting ears, E, with slots or chase mortises in which the pivots of the light frame or cell turn, allowing the light to be hauled from its seat, and consequently out of contact with the india-rubber, so as to allow the plane of the light to be placed at an angle to the main frame, thus freely admitting of ventilation.

I further claim the arrangement of a lead or other ductile metallic ring soldered on or otherwise joined to the main brass frame of the light, as that it can be turned round the outer edge of the opening in the vessel, securing any suitable material completely making the main frame of the light water-tight to the vessel: substantially as herein set forth.

[This invention admits of the light being adjusted in a water-tight position and also admits of it being adjusted in an open or partially open state for ventilation.]

1,534.—Tackle Block.—Isaac E. Palmer, Montville, Conn. Patented Nov. 1, 1859:

I claim so constructing a tackle block and pulley, that the rope or fall when desired may be clamped between a fixed portion of the block and a portion of the pulley, substantially as herein described, by simply leading it in a direction oblique to the plane of revolution of the pulley without tying, or the use of dogs, movable stops or any other means of fastening.

1,535.—Ventilated Hats.—William F. Warburton, Philadelphia, Pa. Patented Dec. 11, 1860:

I claim a flexible band or strip of metal or other equivalent material, secured to the inside of a hat, at such a distance from the same, and between such points that it will accommodate itself to the wearer's forehead, without interfering with the passage of air between the said band and the hat as set forth.

NOTE.—The large number of patents issued weekly indicate the state of progress in the mechanic arts better than any thing else. Out of the number issued last week and recorded above, THIRTY-FOUR—more than one-third of the entire number—were obtained through the Scientific American Patent Agency.

IMPORTANT TO INVENTORS

PATENTS FOR SEVENTEEN YEARS.

MESSRS. MUNN & CO., PROPRIETORS OF THE SCIENTIFIC AMERICAN, continue to solicit patents in the United States and all foreign countries, on the most reasonable terms. They also attend to various other departments of business pertaining to patents, such as Extensions, Appeals before the United States Court, Interferences, Opinions relative to Infringements, &c. The long experience Messrs. MUNN & Co. have had in preparing Specifications and Drawings has rendered them perfectly conversant with the mode of doing business at the United States Patent Office, and with the greater part of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

THE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent free of charge. Address MUNN & CO., No. 37 Park Row, New York.

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The service we render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there, but is an opinion based upon what knowledge we may acquire of a similar invention from the records in our Home Office. But for a fee of $5, accompanied with a model of drawing and description, we have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through our Branch Office, corner of F and Seventh streets, Washington, by experienced and competent persons. Many thousands of such examinations have been made through this office. Address MUNN & CO., No. 37 Park Row, New York.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention if susceptible of one; or, if the invention is a chemical productions he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them and sent, with the Government fees, by express. The express charge should be pre-paid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by draft on New York, payable to the order of MUNN & CO. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little risk in sending bank-bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row, New York.

The revised Patent Laws, enacted by Congress on the 2d of March, 861, are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The duration of patents granted under the new act is prolonged to SEVENTEEN years, and the Government fee required on filing an application for a patent is *reduced* from **$30 to $15.** Other changes in the fees are also made as follows:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Re-issue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design, three and a half years	$10
On filing application for Design, seven years	$15
On filing application for design, fourteen years	$30

The law abolishes discrimination in fees required of foreigners, excepting natives of such countries as discriminate against citizens of the United States—thus allowing Austrian, French, Belgian, English, Russian, Spanish and all other foreigners except the Canadians, to enjoy all the privileges of our patent system (but in cases of designs) on the above terms. Foreigners cannot secure their inventions by filing a caveat; to citizens only is this privilege accorded.

During the last seventeen years, the business of procuring Patents or new inventions in the United States and all foreign countries has been conducted by Messrs. MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN; and as an evidence of the confidence reposed in our Agency by inventors throughout the country we would state that we have acted as agents for at least TWENTY THOUSAND inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of inventors and patentees at home and abroad. Thousands of inventors for whom we have taken out patents have addressed to us most flattering testimonials for the services we have rendered them, and the wealth which has inured to the inventors whose patents were secured through this office, and afterwards illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! We would state that we never had a more efficient corps of Draughtsmen and Specification Writers than those employed at present in our extensive offices, and we are prepared to attend to patent business of all kinds in the quickest time and on the most liberal terms.

REJECTED APPLICATIONS.

We are prepared to undertake the investigation and prosecution of rejected cases on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted, are invited to correspond with us on the subject, giving a brief history of the case, inclosing the official letters, &c.

CAVEATS.

Persons desiring to file a caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention. The Government fee for a caveat, under the new law, is $10. A pamphlet of advice regarding applications for patents and caveats, printed in English and German, is furnished gratis on application by mail. Address MUNN & CO., No. 37 Park Row, New York.

FOREIGN PATENTS.

We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through the Scientific American Patent Agency, No. 37 Park Row, New York.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents in foreign countries through our Agency, the requirements of different Government Patent Offices, &c., may be had gratis upon application at our principal office, No. 37 Park Row, New York, or any of our branch offices.

ASSIGNMENTS OF PATENTS.

Assignments of patents, and agreements between patentees and manufacturers are carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park Row, New York.

It would require many columns to detail all the ways in which inventors or patentees may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Park Row, New York, whereany questions regarding the rights of patentees will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid), should be addressed to MUNN & CO., No. 37 Park Row, New York.

Notes and Queries

R. S. G., of Maine.—The difference between stenography and phonography is this: the one means short-writing, the other sound-writing—both being of Greek derivation. Short-hand was known to the ancient Romans; sound hand is the invention of Isaac Pitman, of Bath, England, not thirty years ago. His brother, Benn, of Cincinnati, Ohio, is a publisher of phonographic and phonetic works in this country, and has done much for the dissemination of the art in America. Stenography is composed of arbitrary signs; phonography of conventional characters, variable by rule, and completely supplanting our alphabet. The Hebrew and Chinese are examples of phonetic languages, oftenest seen in this country. Next to telegraphy, phonography is the most wonderful invention of this age. The fastest writer in long-hand can only record forty words in a minute; a good phonographer can report two hundred—just five times as many. It is the only way in which rapid discourses and fluent orations can be recorded verbatim. It is by this wonderful art that we get all that is said in Parliament or Congress. Pitman's characters are not so even and beautiful to look at as Morse's dot-line space reading, yet they are equally wonderful as an invention, and as indispensable in their utility. Phonetic printing, or printing by sound, does not seem to take in America, though it has been adopted in the common schools of Massachusetts and California. The Bible has been printed in it in England.

D. McIn., of C. W.—You will find no difficulty in melting metal in a cupola 5 feet in hight and 15 inches internal diameter, if you employ sufficient blast. A fan will run smoother with four than three arms; one with six vanes will run with less noise but the effect will be no greater. Vulcanite grindstones, composed of emery and vulcanized india-rubber, are manufactured here, but no artificial sand-stones, so far as we know.

A. S., of N. Y.—Insert au advertisement in the SCIENTIFIC AMERICAN, and you will obtain any kind of a lathe you require. We cannot advertise your wants gratuitously.

G. E. P., of Pa.—We are not aware of small spinning jennies containing about 8 spindles, adapted for family use, being manufactured anywhere. We believe that jennies of such a size would meet with an extensive sale, among our farmers: who could operate them with their horse powers, and spin their own flax and woolen yarn.

L. R., of N. Y.—A complete business directory for the State of New York is published by Messrs. Adams Sampson & Co. Boston, Mass.

F. N. B., of Wis.—Cotton thread is numbered according to the number of hanks to a pound. A hank is 840 yards.

J. B., of Maine.—You will find the mode of making vegetable parchment described on page 186, current volume of the SCIENTIFIC AMERICAN.

H. C. A., of Ohio.—There is no special work published on caloric engines. You will find more information respecting such engines in former volumes of the SCIENTIFIC AMERICAN, than in all other published works extant.

E. J. H. H., of Pa.—"Holtzapffel's Mechanical Manipulations" have not been republished in America.

G. W. J., of Mo.—To bronze the barrel of your fowling piece, apply the tincture of iodine diluted with an equal quantity of soft water, allow it to dry, then brush it and rub with a little beeswax and turpentine. Another method of bronzing consists in applying a composition of 1 ounce of the muriate of iron, 1 ounce of nitric acid, and 1 ounce of the sulphate of copper dissolved in 3 ounces of water. It is put on with a clean rag, and the barrel allowed to dry; then a second application is made in the same manner, and when the barrel again becomes dry it is washed with a little limewater, dried, brushed, and rubbed with wax and turpentine. Some persons use a solution of the sulphate of copper and nitric acid only. The first mode described above—using the iodine, will be most convenient for your purpose,

Money Received

At the Scientific American Office, on account of Patent Office business, from Wednesday, Sept. 9, to Wednesday, Sept. 16, 1863:—

L. M., of N. Y., $16; D. D., of N. Y., $16; J. G. G., of N. Y., $16; P. B., of Ill., $20; P. J., of France, $20; M. F., of N. Y., $16; M. L. S., of N. J., $10; G. & H., of Mass., $20; G. F. J., of Iowa, $20; B. R. & V., of Ohio, $20; R. H. R, of N. Y., $16; L. & S. B. H., of Mass., $20; E. C. W., of N. Y., $128; J. W. S., of Conn., $20; H. A. A., of N. Y., $16; L. O. B., of Ind., $55; J. C., of Ind., $45; J. H. of Mass., $20; A. H., of Ill., $20; S. E. T., of N. J, $36; E. C., of N. Y., $20; J. D., of Ill., $20; C. S., of N. Y., $22; T. H., of Cal. $63; W. D., of N. Y., $41; J. M., of N. Y., $20; R. L., of N. Y., $25; C. L., of N. Y., $25; J. E., of N. Y., $25; R. W. C., of N. Y., $25; H. J. Van T., of N. Y., $25; F. J., of N. Y., $25; W. D., of N. Y., $25; E. J. K., of Mich., $20; S. R., of N. Y., $16; H. & G., of Ill., $25; T. G. E., of R. I., $100; W. G., of N. Y., $16; A. T., of N. Y., $16; N. V., of N. J., $12; W. H. B, of Cal., $23; C. W. & W. W. M., of Ill., $25; J. C., of Mich., $16; J. W. R., of Conn., $25; H. L., of Mich., $60; P. G., of Mo., $21; C. J. B., of Ill., $16; G. M., of Canada $20; E. W., of Mich., $26; E. M., of N. Y., $30; H. & S., of Pa., $26; J. C., of N. J., $25; E. & W., of N. Y., $16; A. H. T., of R. I., $25; J. V. V. B., of N. Y., $131; S. M. P., of Ohio $16; C. H H., of N. Y., $41; D. B. N., of Ind., $10; N. V., of N. J., $22; G. W. of Iowa, $16; W. A. S., of N. Y., $16; A. J. M., of N. Y., $20; P. C. of Pa., $16; W. B., of Canada, $25; C. R., of Pa., $25.

And a check of $20 from Lowell, Mass., on a Boston bank, enclosed in an envelope, but no note or name attached to indicate the sender, If this meets the careless person's eye he will probably take warning in future,

Persons having remitted money to this office will please to examine the above list to see that their initials appear in it, and if they have not received an acknowledgment by mail, and their initials are not to be found in this list, they will please notify us immediately, and inform us the amount, and how it was sent, whether by mail or express.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office from Wednesday, Sept. 9], to Wednesday, Sept. 16, 1863:—

S. E. T., of N. J.; C. S., of N. Y.; T. H., of Cal., (2 cases); W. D., of N. Y.; F. J., of N. Y.; H. J. Van T., of N. Y.; R. W. C., of N. Y.; J. E., of N. Y.; C. L., of N. Y.; R. L., of N. Y.; W. B., of Canada; C. R., of Pa.; C. B., of Cal.; N. V., of N. J.; W. R., of N. Y.; H. & S., of Pa.; J. C., of N. J.; A. H. T., of R. I.; E. W., of Mich.; E. M., of N. Y.; C. J. B., of Ill.; F. B. P., of Mass.; J. W. R., of Conn.; W. H. B., of Cal.; C. W. & W. W. M., of Ill.; H. & G., of Ill.

RATES OF ADVERTISING.

Twenty-five Cents per line for each and every insertion payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published, we will explain that ten words average one line. Engravings will not be admitted into our advertising columns, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement hey may deem objectionable.

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TO TOOL MANUFACTURERS.—THE ENTIRE PATENT on the Leather-rounding Machine, illustrated in this issue is for sale. The machine works good, and will sell. Address P. BECKMAN, Napierville, Ill. 1*

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MCNAMEE'S WAGON POLE CHECK ARRESTER.—Rights of this simple and useful invention are for sale. It is already extensively in use, and well liked. Any one who owns a team will use it—can be attached to any pole, chain or strap. Any blacksmith can make them, and will prove a profitable business to any one wishing to secure a State, County or Township right. See the illustration in this number. 1*

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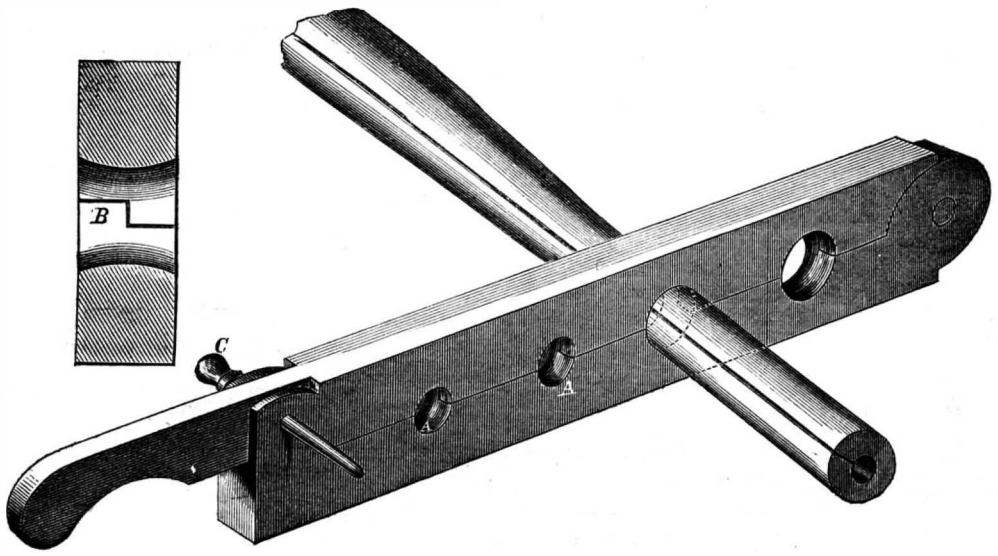
Improved Leather-rounding Machine.

For very many purposes of commerce and the arts, it is necessary to produce thongs, or continuous lengths of leather, of a cylindrical form ; this is done for many reasons, both of appearance and to adapt the thong to the work required of it. Traces, small machine-belts, &c., are thus manipulated. In many devices hitherto employed for this purpose, a faulty construction and design has materially conflicted with obtaining a fine quality of work, as the leather became scratched and otherwise defaced in its passage through the holes. The instrument herewith illustrated is intended to obviate this defect, and is so constructed that the leather, previously stitched in a rounded form, in passing through the holes, A, in the metallic bars, meets with no projections or sharp

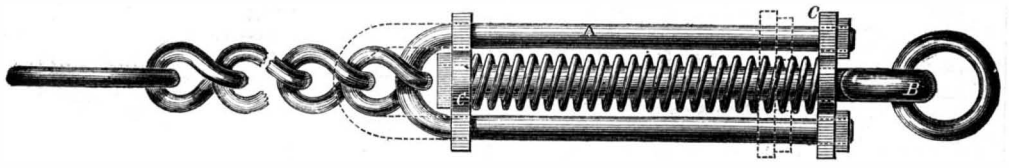


BECKMAN'S PATENT LEATHER-ROUNDING MACHINE.

corners, to mar its surface. This end is obtained by causing the two bars to break joint, as shown at B, in the section of the instrument. The pin, C, retains the bars in close contact with each other, while the operation is being performed. When extra-nice work is required, the strap is channeled at the edges so as to hide the stitches. Any number of apertures desired can be introduced into the instrument. The interior surfaces of these holes are highly polished, and not only round the leather, but also impart a handsome finish to the same in its passage. This machine was patented on July 28, 1863, by Philip Beckman, of Napierville, Ill. Further information can be had by addressing him at that place.

Improved Wagon Pole Check.

The sympathies of every sensitive person have been aroused by the injuries inflicted on dumb animals ; some of which are unavoidable and others



MC'NAMEE'S PATENT WAGON POLE CHECK.

wanton. Of the unavoidable class, those to which horses are subjected by the violent motion of the pole on a heavy wagon or coach, call earnestly for some improvement, as many valuable beasts have been badly bruised and injured by this very cause. On our city pavements there are frequently deep ruts into which the omnibus wheels roll ; when this takes place, the pole flies violently, one way or the other, against the horse's breast or shoulder, and numbers of these animals can be seen daily badly chafed and lamed from this difficulty. The invention which is herewith illustrated is designed to remove the evil referred to ; and the numerous testimonials we have seen from those who have tried it, confirm our own opinion that there is no question but it will fulfil the ends for which it was intended. The apparatus consists of a strong wrought-iron link or shackle, A, which has a rod, B, running through the center ; this rod has a spiral spring upon it, which works between the shoulder-plates, C, secured by nuts to the rod and shackle. The plate in the circular end of the shackle slides freely over it, and moves readily when a strain comes upon the rod or chain.

The action of this apparatus is apparent at a glance ; when the rings on the end of the arrester are connected to the pole and the collar of the harness, any sudden strain, caused by the uneven nature of the road, and thrown on the horses, is relieved by the yielding of the spring, as shown by the dotted lines : sudden jars, shocks, and concussions, are so much alleviated that their evil effect is lost, and horses can travel much further without distress than where the old-fashioned hold-back strap is used alone. This apparatus is sold remarkably low, and will most effectually remedy the evil complained of.

It was patented through the Scientific American Patent Agency, on July 14, 1863, by James McNamee, of Easton, Pa. Further information can be had by addressing the inventor as above.

A "Swamp Angel" Incident.

A correspondent of the *Philadelphia Inquirer* says :—

"Colonel Serrell, of the New York Engineers, had the charge of the construction of the 'Swamp Angel,' and being of an energetic constitution himself, and not afraid to enter swamps, you can imagine his surprise when one of his lieutenants, whom he had ordered to take twenty men and enter this swamp, said that he 'could not do it—the mud was too deep.' Colonel Serrell ordered him to try, He did so, and the lieutenant returned with his men covered with mud, and said :—

"'Colonel, the mud is over my men's heads ; I can't do it.'"

"The colonel insisted, and told the lieutenant to make a requisition for anything that was necessary for the safe passage of the swamp. The lieutenant made his requisition in writing, and on the spot. It was as follows :—

"'I want twenty men eighteen feet long, to cross a swamp fifteen feet deep.'

"The joke was a good one. It secured, however, not a cubit to the stature of the lieutenant, but rather his arrest for disrespect to his superior. The battery, however, was built with the aid of wheelbarrows and sand."

Use the Kitchen Slops.

English agricultural papers just now are full of articles upon the use of sewerage or waste of cities. Bringing this subject down to individuals, we might write a long article on the waste of the house, had not the subject been so frequently presented in our columns. Again we say allow no fertilizing material to go to waste. The water from the kitchen is rich in elements of fertility. The soap used in washing, pot, liquor, salt, &c., are all needed by the garden, and will amply repay for saving and applying to the plants. On many farms the sink spout discharges into a gutter, and the waste water is allowed to soak away or evaporate. Just along the edges of this gutter will be found a most luxuriant growth of weeds, showing plainly that the ground here is richer than elsewhere. Let the kitchen waste be collected in a sunken hogshead or cistern, and applied, in a liquid form, to the plants in the garden, or run it to a convenient distance from the house to an excavation which can be readily supplied with muck, which will absorb the liquid, and many dollars worth of manure now annually wasted, will be saved.

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To the Inventor !

The SCIENTIFIC AMERICAN is indispensable to every inventor, as it not only contains illustrated descriptions of nearly all the best inventions as they come, but each number contains an Official List of the Claims of all the Patents issued from the United States Patent Office during the week previous ; thus giving a correct history of the progress of inventions in this country. We are also receiving, every week, the best scientific journals of Great Britain, France and Germany ; thus placing in our possession all that is transpiring in mechanical science and art in those old countries. From those journals we shall continue to transfer to our columns copious extracts of whatever we may deem of interest to our readers.

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No person engaged in any of the mechanical pursuits should think of doing without the SCIENTIFIC AMERICAN. It costs but six cents per week ; every number contains from six to ten engravings of new machines and inventions which cannot be found in any other publication. It is an established rule of the publishers to insert none but *original* engravings, and those of the first class in the art, drawn and engraved by experienced artists, under their own supervision, expressly for this paper.

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